```
=> d his

     (FILE 'HOME' ENTERED AT 07:43:32 ON 06 SEP 2007)

     FILE 'REGISTRY' ENTERED AT 07:43:39 ON 06 SEP 2007
L1                STRUCTURE UPLOADED
L2             34 S L1 SSS FULL

     FILE 'CAPLUS' ENTERED AT 07:43:57 ON 06 SEP 2007
L3             75 S L2

     FILE 'STNGUIDE' ENTERED AT 07:44:19 ON 06 SEP 2007

     FILE 'REGISTRY' ENTERED AT 07:44:50 ON 06 SEP 2007

     FILE 'STNGUIDE' ENTERED AT 07:45:15 ON 06 SEP 2007

     FILE 'REGISTRY' ENTERED AT 07:46:22 ON 06 SEP 2007
L4                STRUCTURE UPLOADED
L5              3 S L4 SAM SUB=L2
L6             11 S L4 SSS FULL SUB=L2
L7             23 S L2 NOT L6

     FILE 'CAPLUS' ENTERED AT 07:46:57 ON 06 SEP 2007
L8             72 S L7

     FILE 'REGISTRY' ENTERED AT 07:47:02 ON 06 SEP 2007

     FILE 'STNGUIDE' ENTERED AT 07:47:23 ON 06 SEP 2007

     FILE 'REGISTRY' ENTERED AT 07:48:11 ON 06 SEP 2007

     FILE 'CAPLUS' ENTERED AT 07:48:25 ON 06 SEP 2007
L9             63 S L8 AND PREP/RL

     FILE 'REGISTRY' ENTERED AT 07:49:06 ON 06 SEP 2007

     FILE 'CAPLUS' ENTERED AT 07:49:27 ON 06 SEP 2007
L10             2 S US200!-541021/APPS
L11            62 S L9 NOT L10

     FILE 'REGISTRY' ENTERED AT 07:50:09 ON 06 SEP 2007

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L1 HAS NO ANSWERS
L1                STR
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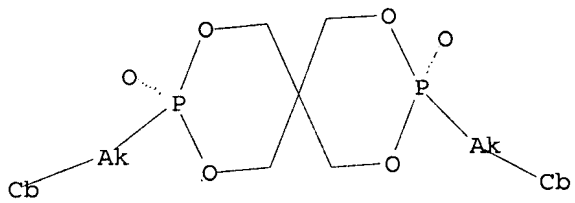


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Structure attributes must be viewed using STN Express query preparation.


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L4 HAS NO ANSWERS
L4                STR
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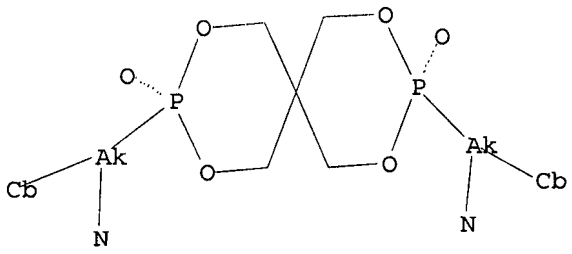

Structure attributes must be viewed using STN Express query preparation.

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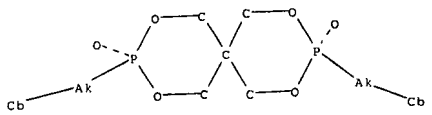

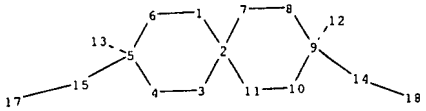

chain nodes :
12 13 14 15 17 18
ring nodes :
1 2 3 4 5 6 7 8 9 10 11
chain bonds :
5-13 5-15 9-12 9-14 14-18 15-17
ring bonds :
1-2 1-6 2-3 2-7 2-11 3-4 4-5 5-6 7-8 8-9 9-10 10-11
exact/norm bonds :
1-2 1-6 2-3 2-7 2-11 3-4 4-5 5-6 5-13 5-15 7-8 8-9 9-10 9-12 9-14 10-11
14-18 15-17
isolated ring systems :
containing 1 :

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:CLASS 13:CLASS 14:CLASS 15:CLASS 17:Atom 18:Atom
Generic attributes :
17:
Saturation : Unsaturated
18:
Saturation : Unsaturated

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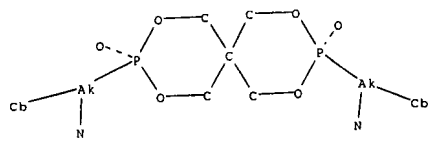
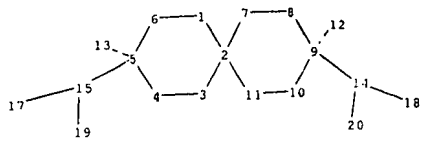




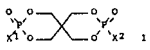
chain nodes :
12 13 14 15 17 18 19 20
ring nodes :
1 2 3 4 5 6 7 8 9 10 11
chain bonds :
5-13 5-15 9-12 9-14 14-18 14-20 15-17 15-19
ring bonds :
1-2 1-6 2-3 2-7 2-11 3-4 4-5 5-6 7-8 8-9 9-10 10-11
exact/norm bonds :
1-2 1-6 2-3 2-7 2-11 3-4 4-5 5-6 5-13 5-15 7-8 8-9 9-10 9-12 9-14 10011
14-18 14-20 15-17 15-19
isolated ring systems :
containing 1 :

Match level :
1:Atom 2:Atom 3:Atom 4:Atom 5:Atom 6:Atom 7:Atom 8:Atom 9:Atom 10:Atom 11:Atom
12:CLASS 13:CLASS 14:CLASS 15:CLASS 17:Atom 18:Atom 19:CLASS 20:CLASS
Generic attributes :
17:
Saturation : Unsaturated
18:
Saturation : Unsaturated

L[illegible] ANSWER 1 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2006:793110 CAPLUS Full-text
DN 145:168548
TI Halogen-free flame-retardant and heat-resistant epoxy resin compositions and their laminates
IN Yamanaka, Katsuhiro
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2006193548	A	20060727	JP 2005-3637	20050111
PRAI JP 2005-3637		20050111		

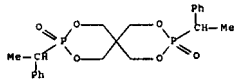
OS MARPAT 145:168548
GI



AB The compns. contain (A) 100 parts epoxy resins, (B) 1-200 parts hardeners, and (C) 0.1-200 parts organophosphorus compds. represented by the general formula I (X1, X2 = aromatic group-substituted alkyl represented by the general formula (AL)(Ar)n; L = C1-5 aliphatic hydrocarbyl; Ar = Ph, naphthyl, or anthryl whose aromatic may be substituted; n = 1-3 integer; Ar bonds to any C atom in AL). Thus, a 50%-nonvolatile MEK-based varnish comprising Epiclon N 770 (A) 100, dicyandiamide 5.5, 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dibenzyl-3,9-dioxide 30, and 2-ethyl-4-methylimidazole 0.1 part was impregnated into glass cloths to give prepregs with resin content 44.4%, 8 pieces of which were stacked together, sandwiched with electrolytic Cu foils, and hot pressed to give a 1.6-mm thick Cu-clad laminate showing flame retardance V-0 (UL-94) and good solder heat resistance (JIS C 6481).
IT 20544-37-0P 62284-92-8P 475101-74-7P
475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(flame retardant; halogen-free flame-retardant and heat-resistant epoxy resin compns. and their Cu clad laminates)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

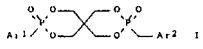
L[illegible] ANSWER 2 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2005:547658 CAPLUS Full-text
DN 143:79071
TI Flame-retardant styrene resin compositions and molded article obtained therefrom
IN Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO PCT Int. Appl., 53 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2005056671	A1	20050623	WO 2003-JP15799	20031210
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD,				

GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2003289015	A1	20050629	AU 2003-289015	20031210
EP 1693412	A1	20060823	EP 2003-778782	20031210
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
CN 1910230	A	20070207	CN 2003-80111035	20031210
US 2007112108	A1	20070517	US 2006-582008	20060608
PRAI WO 2003-JP15799	A	20031210		

OS MARPAT 143:79071
GI



AB A styrene resin composition which is excellent in thermal stability, hue, flowability, and heat resistance and further has flame retardancy; and a molded article formed therefrom which has an excellent appearance. The resin composition comprises (A) 100 parts styrene resins, (B) 0-100 parts polyphenylene ether resins, and (C) 1-100 parts organophosphorus compds. represented formula (I), wherein Ar1 and Ar 2 = Ph or substituted phenyl; satisfying the following requirements (i) the amount of the residue left after heating at 500° ≤10%, (ii) the HPLC purity ≥90%, and (iii) the acid value ≤0.5 mg-KOH/g.
IT 20544-37-0P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(fire-retardant; flame-retardant styrene resin compns. and molded article obtained therefrom)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

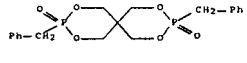
RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L[illegible] ANSWER 3 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:857653 CAPLUS Full-text
DN 141:350867

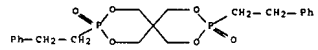
TI Halogen-free flame-retardant styrene resin composition
IN Endo, Shigeru
PA PS Japan Corporation, Japan
SO PCT Int. Appl., 69 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2004087809	A1	20041014	WO 2004-JP4337	20040326
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 1768110	A	20060503	CN 2004-80008516	20040326
US 2006258816	A1	20061116	US 2005-550946	20050928
PRAI JP 2003-90859	A	20030328		
JP 2003-356211	A	20031016		
JP 2003-357404	A	20031017		
WO 2004-JP4337	W	20040326		

OS MARPAT 141:350867
AB Title flame-retardant styrene resin composition comprises (A) 100 parts of a styrene resin having weight retention at 500° of ≤20% and (B) 0.5-50 parts of halogen-free (quasi) sphere-shaped flame-retardant particles, wherein the component (B) with mol. weight of 200-2,000 and area-average diameter of 0.01-3 μm have been dispersed in (A), and have weight retention at 500° of ≥20% and m.p. of 100°- 400°. Thus, a composition was formulated from low-cis polybutadiene rubber-modified α-Me styrene dimer-styrene copolymer 100 and dibenzyl pentaerythritol diphosphonate 2 parts, to give a sample showing UL-94 flame resistance V-2.
IT 20544-37-0 62284-92-8
RL: MOA (Modifier or additive use); USES (Uses)
(halogen-free flame-retardant styrene resin composition)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

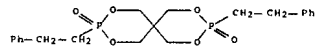
L17 ANSWER 4 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:605791 CAPLUS Full-text
DN 141:124589
TI Fire-resistant resin compositions and molded products therefrom
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 38 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004210968	A	20040729	JP 2003-176	20030106
PRAI JP 2003-176		20030106		

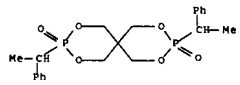
OS MARPAT 141:124589
AB The compns. comprise (A) 100 parts resin components containing ≥60% aromatic polyesters, (B) 1-100 parts 3-X1-9-X2-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide [X1, X2 = (AL)(Ar)n; AL = C1-5 branched or linear aliphatic hydrocarbon; Ar = (un)substituted Ph, naphthyl, anthryl; n = 1-3], (C) 0.1-100 parts compds. containing ≥2 OH, (D) 0-50 parts fireproofing resins, and (E) 0-200 parts fillers. Thus, PBT (TRB-H) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (preparation described) 20, and pentaerythritol 3 parts were blended, pelletized, dried, and injection molded to give a test piece showing UL 94 fire resistance rating V-0 and oxygen index 29.0%.
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-74-7P, 3,9-Bis(α-methylbenzyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-76-9P, 3,9-Bis(diphenylmethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fire-resistant aromatic polyester compns.)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

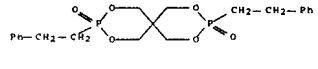
L17 ANSWER 5 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:549757 CAPLUS Full-text
DN 141:89947
TI Halogen-free, fire-resistant resin compositions and molded products therefrom
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004189822	A	20040708	JP 2002-357816	20021210
PRAI JP 2002-357816		20021210		

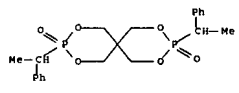
OS MARPAT 141:89947
AB The compns. comprise (A) 100 parts resin components containing ≥60% aromatic polyesters, (B) 1-100 parts 3-X1-9-X2-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide [X1, X2 = (AL)(Ar)n; AL = C1-5

branched or linear aliphatic hydrocarbon; Ar = (un)substituted Ph, naphthyl, anthryl; n = 1-3], (C) 0.1-100 parts compds. containing N, (D) 0.1-100 parts alkali metal salts and/or alkaline earth metal salts, (E) 0-50 parts fireproofing resins, and (F) 0-200 parts fillers. Thus, PBT (TRB-H) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (preparation described) 20, melamine cyanurate (MC 610) 5, and CaCO3 3 parts were blended, pelletized, dried, and injection molded to give a test piece showing UL 94 fire resistance rating V-0 and good hydrolysis resistance.
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-74-7P, 3,9-Bis(α-methylbenzyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-76-9P, 3,9-Bis(diphenylmethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fire-resistant aromatic polyester compns.)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-

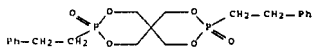
, 3,9-dioxide (9CI) (CA INDEX NAME)

L17 ANSWER 6 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:351704 CAPLUS Full-text
DN 140:358244
TI Halogen-free, fire-resistant resin compositions and molded products therefrom
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 44 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

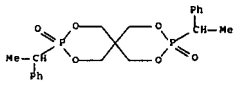
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004131580	A	20040430	JP 2002-297127	20021010
PRAI JP 2002-297127		20021010		

OS MARPAT 140:358244
AB The compns. comprise (A) 100 parts resin components containing ≥60% aromatic polyesters, (B) 1-100 parts 3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-diaralkyl derivs., (C) 0.1-100 parts N-containing compds., (D) 0-50 parts fireproofing resins, and (E) 0-200 parts fillers. Thus, PBT (TRB-H) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (preparation described) 20, and melamine cyanurate (MC 610) 5 parts were blended, pelletized, dried, and injection molded to give a test piece showing UL 94 fire resistance rating V-0 and O index 29.3%.
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-74-7P, 3,9-Bis(α-methylbenzyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-76-9P, 3,9-Bis(diphenylmethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fire-resistant aromatic polyester compns.)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

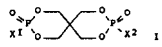


RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L13 ANSWER 9 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:310197 CAPLUS Full-text
DN 140:322337
TI Halogen-free fire-resistant polyamide compositions, moldings therefrom, and spiro bisaralkylphosphonate fireproofing agents therefor
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 30 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

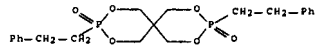
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004115763	A	20040415	JP 2002-285207	20020930
PRAI JP 2002-285207		20020930		

OS MARPAT 140:322337
GI

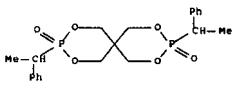


AB The compns. comprise 100:(1-100) (part) (A) polyamides and (B) I [X1, X2 = RArn; R = (branched) C1-5 aliphatic hydrocarbyl(ene); Ar = (substituted) Ph, naphthyl, or anthryl substituted on any C in R; n = 1-3]. Moldings from the compns. are useful for automotive elec. parts, etc. Thus, a 100:15 mixture of Durethan A 30 (nylon 66) and 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dibenzyl-3,9-dioxide (prepared from pentaerythritol, PCl3, and BnBr) was injection molded to give a specimen showing UL 94 fire resistance rating V-0.
IT 20544-37-0P 62284-92-8P 475101-74-7P
475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agents; halogen-free fire-resistant polyamide compns. containing spiro bisaralkylphosphonate fireproofing agents useful for automobile elec. parts)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

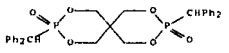
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



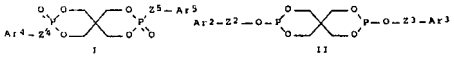
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L13 ANSWER 8 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:271545 CAPLUS Full-text
DN 140:303858
TI Photochemical preparation of high-purity spiro-pentaerythritol bis(phosphonate)s
IN Yanagida, Takatsune; Imamura, Koichi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 28 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

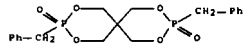
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099565	A	20040402	JP 2002-266622	20020912
PRAI JP 2002-266622		20020912		

OS MARPAT 140:303858
GI



AB Title compds. I [Ar4, Ar5 = C6-20 (un)substituted aryl; Z4, Z5 = CR13R14, CR15R16CR17R18; R13, R14 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R15-R18 = similar group as in R13, R14], useful as halogen-free fireproofing agents, etc., are prepared by chlorination of pentaerythritol with PCl3 in the presence of inert solvents, successive treatment with Ar1Z1OH

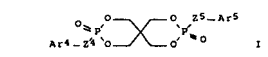
[Ar1 = C6-20 (un)substituted aryl; Z1 = similar group as in Z4, Z5], followed by UV irradiation of the resulting pentaerythritol bis(phosphite)s II (Ar2, Ar3 = similar group as in Ar1; Z2, Z3 = similar group as in Z1). Thus, Pentarit S (pentaerythritol) was chlorinated with PCl3, condensed with PhCH2OH, and UV irradiated to give 80.1% I (Ar4Z4 = Ar5Z5 = PhCH2) with 99.1% purity.
IT 20544-37-0P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(one-pot preparation of high-purity spiro-pentaerythritol bis(phosphonate)s via bis(phosphite)s)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L13 ANSWER 8 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:268555 CAPLUS Full-text
DN 140:304655
TI Preparation of spiro-pentaerythritol diphosphonates using recycled solvents
IN Tanabe, Seiichi; Ando, Shinichi; Imamura, Koichi; Tando, Kazushi; Yanagida, Takatsune; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 28 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099566	A	20040402	JP 2002-266623	20020912
PRAI JP 2002-266623		20020912		

GI

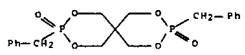


AB Title compds. I [Ar4, Ar5 = C6-20 (un)substituted aryl; Z4, Z5 = CR14R15, CR16R17CR18R19; R14, R15 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R16-R19 = similar group as in R14, R15], useful for fireproofing agents, etc., are prepared by chlorination of pentaerythritol (II) with PCl3 in the presence of inert solvents, successive treatment with Ar1Z1OH [Ar1 = C6-20 (un)substituted aryl; Z1 = similar group as in Z4, Z5] in the presence of organic bases, removal of the bases, their salts, and the solvents, and treatment of the resulting spiro-pentaerythritol diphosphites III (Ar2, Ar3 = similar group as in Ar1; Z2, Z3 = similar group as in Z1) with R13X (R13 = alkali metal, C1-20 alkyl, aralkyl, aryl, etc.; X = Br, iodine) at 80-300°. The removed solvents are recovered and reused in the above process. Thus, II was chlorinated with PCl3 in pyridine and xylene, condensed with PhCH2OH, filtered, the filtrate washed with 1N NaOH, the organic phase evaporated, and refluxed with PhCH2Br to give 89% I (Ar4Z4 = Ar5Z5 = PhCH2) with >99% purity. II was similarly reacted in recovered solvent to give the product without decline in yield or purity.

IT 20544-37-0P, 3,9-Bis(phenylmethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of spiro-pentaerythritol diphosphonates from pentaerythritol using recycled solvents)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L4 ANSWER 10 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:268549 CAPLUS Full-text

DN 140:304654

TI Preparation of spiro-pentaerythritol diphosphonates using recovered halides

IN Imamura, Koichi; Ando, Shinichi; Tanabe, Seiichi; Tando, Kazushi; Yanagida, Takatsune; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF

DT Patent

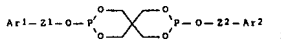
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099550	A	20040402	JP 2002-265180	20020911
PRAI JP 2002-265180		20020911		

OS MARPAT 140:304654

GI



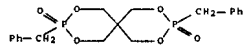
I

AB Title compds. I [Ar3, Ar4 = C6-20 (un)substituted aryl; Z3, Z4 = CR7R8, CR9R10CR11R12; R7, R8 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R9-R12 = similar group as in R7, R8], useful for fireproofing agents, etc., are prepared by treatment of spiro-pentaerythritol diphosphites II (Ar1, Ar2 = similar group as in Ar3, Ar4; Z1, Z2 = similar group as in Z3, Z4) with R13X (R13 = C1-10 alkyl, aralkyl, aryl, alkali metal, etc; X = Br, iodine) at 80-300°, wherein the halides are recovered and reused in the reaction. Thus, II (Ar1Z1 = Ar2Z2 = PhCH2) was refluxed with PhCH2Br in xylene for 4 h to give 91% I (Ar3Z3 = Ar4Z4 = PhCH2) with >99% purity. PhCH2Br was recovered and reused in the rearrangement to give the product without decline in yield or purity.

IT 20544-37-0P, 3,9-Bis(phenylmethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); PREP (Preparation)
(preparation of spiro-pentaerythritol diphosphonates using recovered halides)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L4 ANSWER 11 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:268542 CAPLUS Full-text

DN 140:288188

TI Purification of pentaerythritol spirocyclic diphosphonates as fireproofing agents for polymers

IN Yanagida, Takatsune; Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Tando, Kazushi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 22 pp.
CODEN: JKXXAF

DT Patent

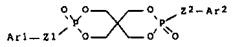
LA Japanese

FAN.CNT 1

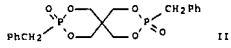
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099526	A	20040402	JP 2002-263849	20020910
PRAI JP 2002-263849		20020910		

OS MARPAT 140:288188

GI



I



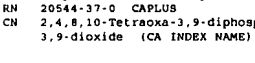
II

AB The compds. I [Ar1, Ar2 = C6-20 (un)substituted aryl; Z1, Z2 = CR1R2, CR3R4CR5R6; R1, R2 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R3-R6 = H, C6-20 (un)substituted aryl; C7-30 (un)substituted aralkyl, C1-20 (un)saturated hydrocarbyl], useful as fireproofing agents, are purified by washing crude I (Ar1, Ar2, Z1, Z2 = same as above) with washing solvents containing ≥50 weight% organic solvents having relative permittivity 10-40 at 25°. The washing solvents are allowed to be reused when they still contain ≥50 weight% of the organic solvents after using. 3,9-Bis[(phenylmethyl)oxy]-2,4,8,10-tetraoxa-3,9- diphosphaspiro[5.5]undecane was treated with benzyl bromide at 120° for 12 h to give I (Z1 = Z2 = CH2, Ar1 = Ar2 = Ph) with 92.0% purity, which was washed with MeOH and filtered to give 30.6 g II with 98.3% purity.

IT 20544-37-0P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PUR (Purification or recovery); PREP (Preparation); USES (Uses)
(purification of pentaerythritol spirocyclic diphosphonates as fireproofing agents with washing solvents containing ≥50% organic solvents having predetd. relative permittivity)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L4 ANSWER 12 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:217191 CAPLUS Full-text

DN 140:253718

TI Preparation of high-purity pentaerythritol spirocyclic diphosphonates without purification of intermediates

IN Tanabe, Seiichi; Yanagida, Takatsune; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004083538	A	20040318	JP 2002-263848	20020910

PRAI JP 2002-194712 A 20020703

OS CASREACT 140:253718; MARPAT 140:253718

GI

I

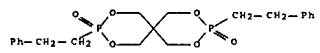
III

AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl, R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl), useful as polymer fireproofing agents, are prepared by treatment of pentaerythritol (II) with PCl3 in nonreactive solvents, treatment of the reaction mixts. with ArCR1R2Cr3/R4OH (Ar = C6-20 aryl, R1-R4 = same as above) in the presence of organic bases, removal of the organic bases and their salts from the reaction mixts. containing diphosphites III (Ar1, Ar2, R1-R8 = same as above), and heating the reaction mixts. in the presence of RX (R = alkali metal, C1-20 alkyl, aralkyl, etc; X = Br, iodide) at 80-300°. Thus, II was treated with PCl3 in o-dichlorobenzene, treated with PhCH2CH2OH in the presence of pyridine, filtered, and the filtrate was washed with aqueous NaOH solution and heated in the presence of PhCH2CH2Br at 130° to give 90.3% I (R1-R8 = H, Ar1 = Ar2 = Ph) with purity 99.3%.

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of high-purity pentaerythritol spirocyclic diphosphonates as polymer fireproofing agents without purification of intermediates)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L4 ANSWER 13 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:217190 CAPLUS Full-text

DN 140:253717

TI Preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s without purification of intermediates

IN Tanabe, Seiichi; Yanagida, Takatsune; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka

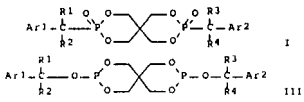
PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 24 pp.

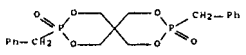
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004083537	A	20040318	JP 2002-263847	20020910
PRAI JP 2002-194711	A	20020703		

OS CASREACT 140:253717; MARPAT 140:253717
GI



AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl, R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl), useful as polymer fireproofing agents, are prepared by treatment of pentaerythritol (II) with PCl3 in nonreactive solvents, treatment of the reaction mixts. with ArCR1R2OH (Ar = C6-20 aryl, R1, R2 = same as above) in the presence of organic bases, removal of the organic bases and their salts from the reaction mixts. containing diphosphites III (Ar1, Ar2, R1-R4 = same as above), and heating the reaction mixts. in the presence of RX (R = alkali metal, C1-20 alkyl, aralkyl, etc; X = Br, iodide) at 80-300°. Thus, II was sequentially treated with PCl3 in xylene and with PhCH2OH in the presence of pyridine, filtered, and the filtrate was washed with aqueous NaOH solution and then heated in the presence of PhCH2Br at 130° to give 90.6% I (R1-R4 = H, Ar1 = Ar2 = Ph) with purity 99.1%.
IT 20544-37-0P, 3,9-Bis(phenylmethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as
polymer fireproofing agents without purification of intermediates)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

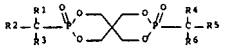


L1H ANSWER 14 OF 76 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:139336 CAPLUS Full-text
DN 140:182448

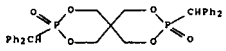
TI Halogen-free fire-resistant aromatic polyester-based resin compositions and their moldings
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 37 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004051917	A	20040219	JP 2002-214951	20020724
PRAI JP 2002-214951		20020724		

OS MARPAT 140:182448
GI



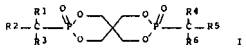
AB Title compns., also having good hydrolysis resistance, comprise 100 parts resins containing ≥60% aromatic polyesters, 1-100 parts organic phosphates I [R1, R4 = H, C1-5 aliphatic hydrocarbyl, (substituted) Ph, (substituted) naphthyl, (substituted) anthryl; R2, R3, R5, R6 = (substituted) Ph, (substituted) naphthyl, (substituted) anthryl], 0.1-100 parts alkali and/or alkaline earth metal salts, 0-50 parts fireproof improver resins, and 0-200 parts fillers. A composition containing TRB-H 100, 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide (prepared from diphenylmethylphosphonic dichloride and pentaerythritol) 15, and CaCO3 5 parts was extruded and molded into a test piece showing UL94 test (for 1.6-mm thickness) V-0 and flexural strength retention ≥70% after 24 h under 120° and 100% relative humidity.
IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic
polyester-based compns. with fire and hydrolysis resistance)
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



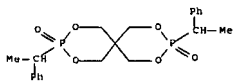
L1H ANSWER 15 OF 76 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:139335 CAPLUS Full-text
DN 140:182447
TI Halogen-free fire-resistant aromatic polyester-based resin compositions and their moldings
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 36 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004051916	A	20040219	JP 2002-214950	20020724
PRAI JP 2002-214950		20020724		

OS MARPAT 140:182447
GI



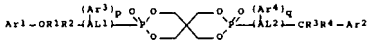
AB Title compns., also having good hydrolysis resistance, comprise 100 parts resins containing ≥60% aromatic polyesters, 1-100 parts organic phosphates I [R1, R4 = H, C1-5 aliphatic hydrocarbyl; R3, R6 = C1-5 aliphatic hydrocarbyl; R2, R5 = (substituted) Ph, (substituted) naphthyl, (substituted) anthryl], 0.1-100 parts alkali and/or alkaline earth metal salts, 0-50 parts fireproof improver resins, and 0-200 parts fillers. A composition containing TRB-H 100, 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane 3,9-di-α- methylbenzyl-3,9-dioxide (prepared from pentaerythritol, PCl3, and 1-phenylethyl bromide) 15, and CaCO3 5 parts was extruded and molded into a test piece showing UL94 test (for 1.6-mm thickness) V-0 and flexural strength retention ≥70% after 24 h under 120° and 100% relative humidity.
IT 475101-74-7P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(diphosphaspiro compound- and alkali (or alkaline earth) salt-containing aromatic
polyester-based compns. with fire and hydrolysis resistance)
RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



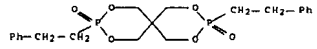
L1H ANSWER 16 OF 76 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:139266 CAPLUS Full-text
DN 140:182441
TI Halogen-free fire-resistant polymer compositions and their moldings with good hydrolysis resistance
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 37 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004051819	A	20040219	JP 2002-212260	20020722
PRAI JP 2002-212260		20020722		

OS MARPAT 140:182441
GI



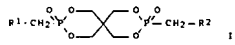
AB The compns. comprise (a) 100 parts polymers containing ≥60% aromatic polyesters, (b) 1-100 parts organic P compds. I [Ar1, Ar2 = (substituted) Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbon group, (substituted) Ph, naphthyl, anthryl; AL1, AL2 = C1-5 aliphatic hydrocarbon group; Ar3, Ar4 = (substituted) Ph, naphthyl, anthryl; p, q = 0-3], (c) 0.1-100 parts alkali metal salts and/or alkaline earth metal salts, (d) 0-50 parts fire resistance-improving polymers, (e) 0-200 parts fillers, and optionally (f) 0.01-10 parts fluoropolymers. Thus, a composition containing TRB H (polybutylene terephthalate) 100, 3,9-bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide 15, and CaCO3 5 parts was injection-molded to give a test piece showing UL-94 rating V-0 (thickness 1.6 mm).
IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; preparation of P-containing fireproofing agents for aromatic
polyester moldings with good hydrolysis resistance)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L[x] ANSWER [x] OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:69269 CAPLUS Full-text
DN 140:182440
TI Halogen-free fire-resistant polymer compositions and their moldings with good hydrolysis resistance
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 36 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

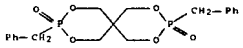
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004051818	A	20040219	JP 2002-212259	20020722
PRAI JP 2002-212259		20020722		

OS MARPAT 140:182440
GI



I

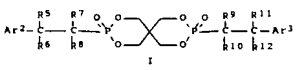
AB The compns. comprise (a) 100 parts polymers containing ≥60% aromatic polyesters, (b) 1-100 parts organic P compds. I [R1, R2 = (substituted) Ph, naphthyl, anthryl], (c) 0.1-100 parts alkali metal salts and/or alkaline earth metal salts, (d) 0-50 parts fire resistance-improving polymers, (e) 0-200 parts fillers, and optionally (f) 0.01-10 parts fluoropolymers. Thus, a composition containing TRB H (polybutylene terephthalate) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide 15, and CaCO3 5 parts was injection-molded to give a test piece showing UL-94 rating V-0 (thickness 1.6 mm).
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; preparation of P-containing fireproofing agents for aromatic polyester moldings with good hydrolysis resistance)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L[x] ANSWER [x] OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:117725 CAPLUS Full-text
DN 140:181622
TI Preparation of colorless and high-purity pentaerythritol spirocyclic bis(phosphonate)s
IN Ando, Shinichi; Yamanaka, Katsuhiro; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004043312	A	20040212	JP 2002-195719	20020704
PRAI JP 2002-195719		20020704		

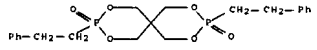
OS CASREACT 140:181622; MARPAT 140:181622
GI



I

AB The title bis(phosphonate)s I (Ar2, Ar3 = C6-20 aryl; R5-R12 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl), useful as fireproofing agents for resins, are prepared by condensation of pentaerythritol (II) with Ar1CR1R2CrJR4P(O)X2 (Ar1 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl; X = Cl, Br, iodide) in the presence of organic bases in organic solvents, dissoln. of byproduct H halide-organic base salts in H2O, removal of the aqueous solns., dispersing of the reaction products in aliphatic monohydric alcs., and filtration of the dispersions. Thus, II was substituted with PhCH2CH2P(O)Cl2 in the presence of pyridine in CHCl3, water was added,hte water phase was removed, the CHCl3 phase was vacuum-concentrated, MeOH was added, and the slurry was filtered to give I (Ar2 = Ar3 = Ph, R5-R12 = H) in 99% purity and having a yellowing index 1.54.
IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-dioxide
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins by condensation of pentaerythritol with phosphonyl dihalides)

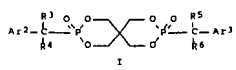
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L[x] ANSWER [x] OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:117724 CAPLUS Full-text
DN 140:181621
TI Preparation of colorless and high-purity pentaerythritol spirocyclic bis(phosphonate)s
IN Ando, Shinichi; Yamanaka, Katsuhiro; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004043311	A	20040212	JP 2002-195718	20020704
PRAI JP 2002-195718		20020704		

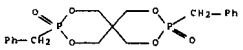
OS CASREACT 140:181621; MARPAT 140:181621
GI



I

AB The title bis(phosphonate)s I (Ar2, Ar3 = C6-20 aryl; R3-R6 = H, C6-20 aryl, C1-20 hydrocarbyl), useful as fireproofing agents for resins, are prepared by condensation of pentaerythritol (II) with Ar1CR1R2P(O)X2 (Ar1 = C6-20 aryl; R1, R2 = H, C6-20 aryl, C1-20 hydrocarbyl; X = Cl, Br, iodide) in the presence of organic bases in organic solvents, dissoln. of byproduct H halide-organic base salts in H2O, removal of the aqueous solns., dispersing of the reaction products in aliphatic monohydric alcs., and filtration of the dispersions. Thus, II was condensed with PhCH2P(O)Cl2 in the presence of pyridine in CHCl3, water was added, the water phase was removed, the CHCl3 phase was vacuum-concentrated, MeOH was added, and the slurry was filtered to give 1 (Ar2 = Ar3 = Ph, R3-R6 = H) in 99% purity and with a yellowing index 2.87.
IT 20544-37-0P, 3,9-Bis(phenylmethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-dioxide 475101-76-9P, 3,9-Bis(diphenylmethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins by condensation of pentaerythritol with phosphonyl dihalides)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L[x] ANSWER [x] OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:97706 CAPLUS Full-text
DN 140:147311
TI Pentaerythritol spirocyclic diphosphonate fireproofing agents, and their polyphenylene ether compositions and moldings with good heat resistance
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035797	A	20040205	JP 2002-196779	20020705
PRAI JP 2002-196779		20020705		

OS MARPAT 140:147311
GI

I

AB The fireproofing agents are I (R1, R4 = H, C1-5 aliphatic hydrocarbyl, Ph, naphthyl, anthryl; R2-R6 = Ph, naphthyl, anthryl). The compns. contain 100 parts blends of 60-100 parts polyphenylene ethers and 0-40 parts styrene polymers, and 1-100 parts I. Thus, an injection molding comprising Zylon (polyphenylene ether) 90, Styron H 9152 (impact-resistant styrene polymer) 10, and I (R1 = R4 = H, R2-R6 = Ph) showed fire resistance (UL 94 test) V-0 and deflection temperature under load 177°.

IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(manufacture of pentaerythritol spirocyclic diphosphonate fireproofing agents with no adverse effect on heat resistance of polyphenylene ether compns. and moldings)

RN 475101-76-9 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L41 ANSWER 23 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97705 CAPLUS Full-text

DN 140:147310

TI Pentaerythritol spirocyclic diphosphonate fireproofing agents, and their polyphenylene ether compositions and moldings with good heat resistance

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 22 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035796	A	20040205	JP 2002-196778	20020705
PRAI JP 2002-196778		20020705		

OS MARPAT 140:147310

GI

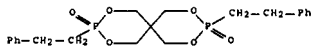
I

AB The fireproofing agents are I (Ar1-Ar4 = Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbyl, Ph, naphthyl, anthryl; AL1, AL2 = C1-5 aliphatic hydrocarbyl; Ar3 and Ar4 may bond to C atom of AL1 and AL2, resp.; p, q = 0-3) and have acid value of ≤0.7 mgKOH/g. The compns. contain 100 parts blends of 60-100 parts polyphenylene ethers and 0-40 parts styrene polymers, and 1-100 parts I. Thus, an injection molding comprising Zylon (polyphenylene ether) 90, Styron H 9152 (impact-resistant styrene polymer) 10, and I (R1-R4 = H, Ar1 = Ar2 = Ph, AL1 = AL2 = CH2, p = q = 0) 5 parts showed fire resistance (UL 94 test) V-0 and deflection temperature under load 175°.

IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(manufacture of pentaerythritol spirocyclic diphosphonate fireproofing agents with no adverse effect on heat resistance of polyphenylene ether compns. and moldings)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L41 ANSWER 22 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97704 CAPLUS Full-text

DN 140:147309

TI Pentaerythritol spirocyclic diphosphonate fireproofing agents, and their polyphenylene ether compositions and moldings with good heat resistance

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035794	A	20040205	JP 2002-196776	20020705
PRAI JP 2002-196776		20020705		

OS MARPAT 140:147309

GI

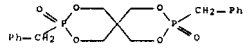
I

AB The fireproofing agents are I (R1, R2 = Ph, naphthyl, anthryl) and have acid value of ≤0.7 mgKOH/g. The compns. contain 100 parts blends of 60-100 parts polyphenylene ethers and 0-40 parts styrene polymers, and 1-100 parts I. Thus, an injection molding comprising Zylon (polyphenylene ether) 90, Styron H 9152 (impact-resistant styrene polymer) 10, and I (R1 = R2 = Ph) 5 parts showed fire resistance (UL 94 test) V-0 and deflection temperature under load 174°.

IT 20544-27-6P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(manufacture of pentaerythritol spirocyclic diphosphonate fireproofing agents with no adverse effect on heat resistance of polyphenylene ether compns. and moldings)

RN 20544-27-6 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L41 ANSWER 23 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97543 CAPLUS Full-text

DN 140:164019

TI Preparation of pentaerythritol spirocyclic bis(phosphonate)s without drying of the bis(hydrophosphonate) intermediate and isolation of the alkali salt intermediates

IN Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF

DT Patent

LA Japanese

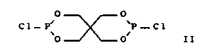
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035481	A	20040205	JP 2002-195717	20020704
PRAI JP 2002-195717		20020704		

OS CASREACT 140:164019; MARPAT 140:164019

GI

I



II

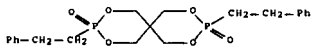
AB The title bis(phosphonate)s I (Y = CR8R9CR6R7Ar2; Z = CR10R11CR12R13Ar3; Ar2, Ar3 = C6-20 aryl; R6-R13 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl), useful as fireproofing agents for resins, are prepared by treatment of pentaerythritol with PCl3 under an inert atmospheric, oxidation of the

resulting bis(chlorophosphite) II with proton sources, filtration of the resulting bis(hydrophosphonate) I (Y, Z = H) under an inert atmospheric, treatment of the solvent-wetted bis(hydrophosphonate) with R1OM (R1 = C1-20 alkyl; M = alkali metal) in organic solvents under an inert atmospheric, and substitution of the resulting alkali metal salt I (Y, Z = alkali metal) solns. with Ar1CR2R3CR4R5X (Ar1 = C6-20 aryl; R2-R5 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl; X = Cl, Br, iodide). Thus, II was oxidized with tert-BuOH, filtered under a N atmospheric, treated with NaOMe in DMF under a N atmospheric, and then substituted with Ph(CH2)2Br to give I (Y = Z = (CH2)2Ph) in 99% purity.

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphonate)s without drying
of the bis(hydrophosphonate) intermediate and isolation of alkali salt intermediates)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L41 ANSWER 24 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97542 CAPLUS Full-text

DN 140:164018

TI Preparation of pentaerythritol spirocyclic bis(phosphonate)s without drying of the bis(hydrophosphonate) intermediate and isolation of alkali salt intermediates

IN Ando, Shinichi; Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 19 pp.
CODEN: JKXXAF

DT Patent

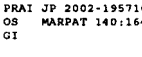
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035480	A	20040205	JP 2002-195716	20020704
PRAI JP 2002-195716		20020704		

OS MARPAT 140:164018

GI



I

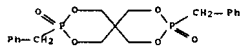
II

AB The title bis(phosphonate)s I (Y = CR4R5Ar2; Z = CR6R7Ar3; Ar2, Ar3 = C6-20 aryl; R4-R7 = H, C6-20 aryl, C1-20 hydrocarbyl), useful as fireproofing agents for resins, are prepared by treatment of pentaerythritol with PCl3 in inert an atmospheric, oxidation of the resulting bis(chlorophosphite) II with proton sources, filtration of the resulting bis(hydrophosphonate) I (Y, Z = H) in an inert atmospheric, treatment of the undried solvent-containing bis(hydrophosphonate) with R1OM (R1 = C1-20 alkyl; M = alkali metal) in organic solvents under an inert atmospheric, and substitution of the resulting alkali metal salt I (Y, Z = alkali metal) solns. with Ar1CR2R3X (Ar1 = C6-20 aryl; R2, R3 = H, C6-20 aryl, C1-20 hydrocarbyl; X = Cl, Br, iodide). Thus, II was oxidized with tert-BuOH, filtered under a N atmospheric, then treated with NaOMe in DMF under a N atmospheric, and then substituted with PhCH2Br to give I (Y = Z = CH2Ph) in 99% purity.

IT 20544-37-0P, 3,9-Dibenzyl-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 475101-74-7P, 3,9-Bis(1-phenylethyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphonate)s without drying of bis(hydrophosphonate) intermediate and isolation of alkali salt intermediates)

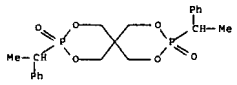
RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



RN 475101-74-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L11 ANSWER 25 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97539 CAPLUS Full-text

DN 140:164017

TI Preparation of high-purity pentaerythritol spirocyclic bis(hydrophosphonate) from the corresponding bis(chlorophosphite)

IN Tando, Kazushi; Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF

DT Patent

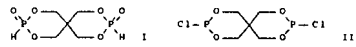
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004035472	A	20040205	JP 2002-194720	20020703
PRAI	JP 2002-194720		20020703		

OS CASREACT 140:164017

GI

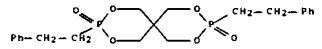


AB The title bis(hydrophosphonate) I is prepared by oxidation of II with proton sources from -20° to 80° in solvents having water content of ≤ 1000 ppm. The bis(hydrophosphonate) I may be filtered in an inert atmospheric and recovered as a solid wetted with the solvents without subsequent drying. Thus, II was oxidized with tert-BuOH at 5° in CH2Cl2 (H2O content 3 ppm) and filtered in a N atmospheric to give CH2Cl2-wetted I with selectivity 90%, vs. selectivity 82% when CH2Cl2 containing 10,000 ppm H2O was used.

IT 62284-92-8P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of high-purity pentaerythritol spirocyclic bis(hydrophosphonate) by oxidation of the corresponding bis(chlorophosphite) in water-free solvents)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L11 ANSWER 26 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97537 CAPLUS Full-text

DN 140:146984

TI Manufacture of low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins

IN Ando, Shinichi; Tando, Kazushi; Imamura, Koichi; Tanabe, Seiichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF

DT Patent

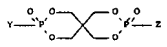
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004035470	A	20040205	JP 2002-194718	20020703
PRAI	JP 2002-194718		20020703		

OS MARPAT 140:146984

GI



AB The diphosphonates I (Y = CCR3R4R1R2Ar1; Z = CR5R6CR7R8Ar2; Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl), useful as fireproofing agents for resins, are manufactured by substitution of I (Y, Z = alkali metals) with Ar3CR9R10CR11R12X (Ar3 = C6-20 aryl; R9-R12 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl; X = Cl, Br, iodide). Thus, 0.80 mol I (Y = Z = Na) was substituted with 1.60 mol PhCH2CH2Br, filtered, and purified with H2O and MeOH to give I (Y = Z = CH2CH2Ph) with purity 99% and content of residual volatile substance 400 ppm. Pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Y = Z =CH2CH2Ph) were injection-molded to give a test piece showing fire resistance (UL 94) V-2 and good appearance. No deposition was observed in the injection mold after molding 500 times.

IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PUR (Purification or recovery); PREP (Preparation); USES (Uses)
(manufacture of low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins from their corresponding alkali metal salts)

RN 62284-92-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L11 ANSWER 27 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:97536 CAPLUS Full-text

DN 140:146983

TI Manufacture of low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins

IN Ando, Shinichi; Imamura, Koichi; Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 19 pp.
CODEN: JKXXAF

DT Patent

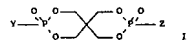
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004035469	A	20040205	JP 2002-194717	20020703
PRAI	JP 2002-194717		20020703		

OS MARPAT 140:146983

GI



AB The diphosphonates I (Y = CR1R2Ar1; Z = CR3R4Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are manufactured by substitution of I (Y, Z = alkali metals) with Ar3CR5R6X (Ar3 = C6-20 aryl; R5, R6 = H, C6-20 aryl, C1-20 hydrocarbyl; X = Cl, Br, iodide). Thus, 0.80 mol I (Y = Z = Na) was substituted with 1.60 mol PhCH2Br, filtered, and purified with H2O and MeOH to give I (Y = Z = CH2Ph) with purity 99% and content of residual volatile substance 350 ppm. Pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Y = Z =CH2Ph) were injection-molded to give a test piece showing fire resistance (UL 94) V-2 and good appearance. No deposition was observed in the injection mold after molding 500 times.

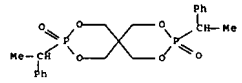
IT 20544-37-0P 475101-74-7P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PUR (Purification or recovery); PREP (Preparation); USES (Uses)
(manufacture of low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins from their corresponding alkali metal salts)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 475101-74-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



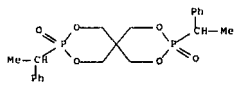
L11 ANSWER 29 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:95692 CAPLUS Full-text
DN 140:147273
TI Pentaerythritol spirocyclic diphosphonate fireproofing agents, and their polyphenylene ether compositions and moldings with good heat resistance
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035795	A	20040205	JP 2002-196777	20020705
PRAI JP 2002-196777		20020705		

OS MARPAT 140:147273
GI

AB The fireproofing agents are I (R1, R4 = H, C1-5 aliphatic hydrocarbyl; R2, R5 = Ph, naphthyl, anthryl; R3, R6 = C1-5 aliphatic hydrocarbyl). The compns. contain 100 parts blends of 60-100 parts polyphenylene ethers and 0-40 parts styrene polymers, and 1-100 parts I. Thus, an injection molding comprising Zylon (polyphenylene ether) 90, Styron H 9152 (impact-resistant styrene polymer) 10, and I (R1 = R4 = H, R2 = R5 = Ph, R3 = R6 = Me) showed fire resistance (UL 94 test) V-0 and deflection temperature under load 172°.
IT 475101-74-7P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(manufacture of pentaerythritol spirocyclic diphosphonate fireproofing agents with no adverse effect on heat resistance of polyphenylene ether compns. and moldings)
RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



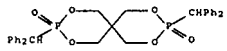
L11 ANSWER 30 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:57592 CAPLUS Full-text
DN 140:112223
TI Flame retardant thermoplastic polycarbonate resin compositions and molded articles
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018767	A	20040122	JP 2002-178370	20020619
PRAI JP 2002-178370		20020619		

OS MARPAT 140:112223
GI

AB The compns., having good heat resistance and processability, comprise 100 parts thermoplastic resins containing ≥50% polycarbonates and 1-100 parts I [R1, R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; R2, R3, R5, R6 = (un)substituted Ph, naphthyl, anthryl] having an acid value of ≤0.7 mg KOH/g and a purity of ≥90%. Thus, a test piece prepared from polycarbonate (Panlite L 1225WP) 100, 3,9-bis(diphenylmethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) (acid value 0.3 mg KOH/g, purity 99%) 5, and PTFE (Polyflon MPA-FA 500) 0.2 part showed UL-94 flammability rating V-0, vs. V-1, for a test piece containing II with acid value 1.9 mg KOH/g.
IT 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fireproofing agents for thermoplastic polycarbonate resin compns.)
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



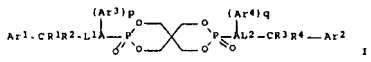
L11 ANSWER 31 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:57585 CAPLUS Full-text
DN 140:112503
TI Halogen-free heat- and fire-resistant transparent ABS resin-based

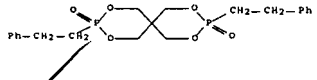
compositions containing organophosphorus compounds, and their moldings
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 34 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018733	A	20040122	JP 2002-177296	20020618
PRAI JP 2002-177296		20020618		

OS MARPAT 140:112503
GI



AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [Ar1-Ar4 = (un)substituted Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; AL1, AL2 = C1-5 linear or branched aliphatic hydrocarbyl; p, q = 0-3]. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-di(2- phenylethyl)-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 96%, and no burn marks.
IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L11 ANSWER 32 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

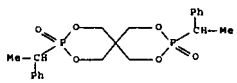
AN 2004:57551 CAPLUS Full-text
DN 140:112220
TI Halogen-free styrene polymer compositions with good flowability and heat and fire resistance, and their moldings

IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 19 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018626	A	20040122	JP 2002-173995	20020614
PRAI JP 2002-173995		20020614		

OS MARPAT 140:112220
GI

AB The compns. comprise (A) styrene polymers 100, (B) polyphenylene ethers 1-100, and (C) organic P compds. I (R1, R4 = H, C1-5-aliphatic hydrocarbon group; R3, R6 = C1-5-aliphatic hydrocarbon group; R2, R5 = Ph, naphthyl, anthryl) 1-100 parts. Thus, a composition comprising 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(α-methylbenzyl)-3,9-dioxide, a high-impact polystyrene (Styron H 9152), and polyphenylene ether (Zylon) was injection-molded to give a test piece showing limiting O index (LOI) 25.2%, heat distortion temperature 82°, flowability (MVR) 13.7 cm3/10 min, and UL 94 fire resistance rating V0.
IT 475101-74-7P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; pentaerythritol diphosphonate fireproofing agents for styrene polymer compns. with good flowability and heat resistance)
RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



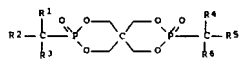
L11 ANSWER 33 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:59648 CAPLUS Full-text

DN 140:112485
TI Halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds, and their moldings
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018734	A	20040122	JP 2002-177297	20020618
PRAI JP 2002-177297		20020618		

OS MARPAT 140:112485
GI



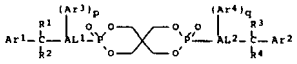
AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; R2, R3, R5, R6 = (un)substituted Ph, naphthyl, anthryl]. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane- 3,9-bis(diphenylmethyl)-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 98%, and no burn marks.
IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L[illegible] ANSWER 33 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55638 CAPLUS Full-text
DN 140:129119
TI Halogen-free styrene polymer compositions with good flowability and heat and fire resistance, and their moldings

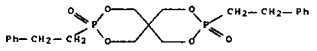
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018627	A	20040122	JP 2002-173996	20020614
PRAI JP 2002-173996		20020614		

OS MARPAT 140:129119
GI



AB The compns. comprise (A) styrene polymers 100, (B) polyphenylene ethers 1-100, and (C) organic P compds. I (Ar1-4 = Ph, naphthyl, anthryl; R1-4 = H, C1-5-aliphatic hydrocarbon group, Ph, naphthyl, anthryl; AL1, AL2 = C1-5-aliphatic hydrocarbon group; p, q = 0-3; Ar3 and Ar4 may link to atoms in AL1 and AL2) 1-100 parts. Thus, a composition comprising 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)- 3,9-dioxide, a high-impact polystyrene (Styron H 9152), and polyphenylene ether (Zylon) was injection-molded to give a test piece showing limiting O index (LOI) 24.3%, heat distortion temperature 83°, flowability (MVR) 12.6 cm3/10 min, and UL 94 fire resistance rating V0.
IT 62284-92-8P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; pentaerythritol diphosphonate fireproofing agents for styrene polymer compns. with good flowability and heat resistance)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

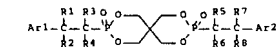


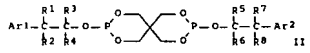
L[illegible] ANSWER 34 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55600 CAPLUS Full-text
DN 140:111527

TI Preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins
IN Imamura, Koichi; Tanabe, Seiichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

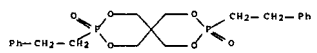
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018387	A	20040122	JP 2002-171213	20020612
PRAI JP 2002-171213		20020612		

OS CASREACT 140:111527; MARPAT 140:111527
GI





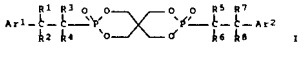
AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by heating II (Ar1, Ar2, R1-R8 = same as above) having purity ≥95% in the presence of halogenated compds. at 120-250°. Thus, II (R1-R8 = H, Ar1 = Ar2 = Ph; purity 99%) was heated in the presence of Ph(CH2)2Br at 180° to give I (R1-R8, Ar1, Ar2 = same as above) showing purity 99% with selectivity 92%.
IT 62284-92-8P, 3,9-Bis(2-phenylethyl) 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins by heating corresponding diphosphites with halogen compds.)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



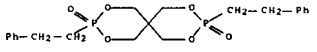
L[illegible] ANSWER 35 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55599 CAPLUS Full-text
DN 140:112216
TI Pentaerythritol spirocyclic diphosphonates as fireproofing agents with no halogen gas generation in kneading with resins
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018383	A	20040122	JP 2002-171209	20020612
PRAI JP 2002-171209		20020612		

OS MARPAT 140:112216
GI



AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) have content of total residual halogen of ≤3000 ppm and ionic halogen of ≤1000 ppm. Thus, pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Ar1 = Ar2 = Ph, R1-R8 = H; total residual halogen 120 ppm, ionic halogen 41 ppm) were injection-molded to give a test piece showing fire resistance (UL 94) V-2 and good appearance. No deposition was observed in the injection mold after molding 500 times.
IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(pentaerythritol spirocyclic diphosphonates as fireproofing agents with no halogen gas generation in kneading with resins)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

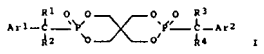


L[illegible] ANSWER 36 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55598 CAPLUS Full-text
DN 140:112215
TI Pentaerythritol spirocyclic diphosphonates as fireproofing agents with no

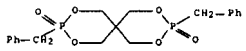
halogen gas generation in kneading with resins
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018382	A	20040122	JP 2002-171208	20020612
PRAI JP 2002-171208		20020612		

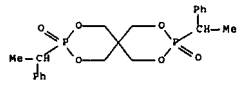
OS MARPAT 140:112215
GI



AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) have content of total residual halogen of ≤3000 ppm and ionic halogen of ≤1000 ppm. Thus, pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Ar1 = Ar2 = Ph, R1-R4 = H; total residual halogen 100 ppm, ionic halogen 36 ppm) were injection-molded to give a test piece showing fire resistance (UL 94) V-2 and good appearance. No deposition was observed in the injection mold after molding 500 times.
IT 20544-37-0P 475101-74-7P 475101-76-9P,
2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(pentaerythritol spirocyclic diphosphonates as fireproofing agents with no halogen gas generation in kneading with resins)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

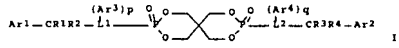


RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L1 ANSWER 39 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52963 CAPLUS Full-text
DN 140:112210
TI Flame retardant thermoplastic polycarbonate resin compositions and molded articles
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

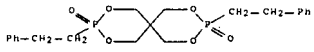
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018766	A	20040122	JP 2002-178369	20020619
PRAI JP 2002-178369		20020619		

OS MARPAT 140:112210
GI



AB The compns., having good heat resistance and processability, comprise 100 parts thermoplastic resins containing ≥50% polycarbonates and 1-100 parts I [Ar1-Ar4 = (un)substituted Ph, naphthyl, anthryl; L1, L2 = C1-5 aliphatic hydrocarbon group; R1-R4 = H, C1-5 aliphatic hydrocarbyl, (un)substituted Ph, naphthyl, anthryl; p, q = 0-3] having an acid value of ≤0.7 mg KOH/g and a purity of ≥90%. Thus, a test piece prepared from polycarbonate (Panlite L

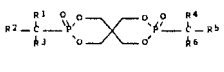
1225WP) 100, 3,9-di(2-phenylethyl)- 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) (acid value 0.03 mg KOH/g, purity 99%) 5, and PTFE (Polyflon MPA-FA 500) 0.2 part showed UL-94 flammability rating V-0, vs. V-1, for a test piece containing II with acid value 1.7 mg KOH/g.
IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fireproofing agents for thermoplastic polycarbonate resin compns.)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L1 ANSWER 38 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52962 CAPLUS Full-text
DN 140:112209
TI Flame retardant thermoplastic polycarbonate resin compositions and molded articles
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 39 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

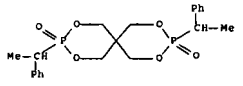
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018765	A	20040122	JP 2002-178368	20020619
PRAI JP 2002-178368		20020619		

OS MARPAT 140:112209
GI



AB The compns., having good heat resistance and processability, comprise 100 parts thermoplastic resins containing ≥50% polycarbonates and 1-100 parts I [R1, R4 = H, C1-5 aliphatic hydrocarbyl; R3, R6 = C1-5 aliphatic hydrocarbyl; R2, R5 = (un)substituted Ph, naphthyl, anthryl] having an acid value of ≤0.7 mg KOH/g and a purity of ≥90%. Thus, a test piece prepared from polycarbonate

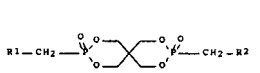
(Panlite L 1225WP) 100, 3,9-di(α-methylbenzyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) (acid value 0.03 mg KOH/g, purity 99%) 5, and PTFE (Polyflon MPA-FA 500) 0.2 part showed UL-94 flammability rating V-0, vs. V-1, for a test piece containing II with acid value 2.1 mg KOH/g.
IT 475101-74-7P, 3,9-Bis(α-methylbenzyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fireproofing agents for thermoplastic polycarbonate resin compns.)
RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L1 ANSWER 37 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52961 CAPLUS Full-text
DN 140:112208
TI Flame retardant thermoplastic polycarbonate resin compositions and molded articles
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 41 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018764	A	20040122	JP 2002-178367	20020619
PRAI JP 2002-178367		20020619		

OS MARPAT 140:112208
GI



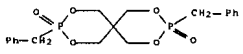
AB The compns., having good heat resistance and processability, comprise 100 parts thermoplastic resins containing ≥50% polycarbonates and 1-100 parts I [R1, R2 = (un)substituted Ph, naphthyl, anthryl] having an acid value of ≤0.7

mg KOH/g and a purity of ≥90%. Thus, a test piece prepared from polycarbonate (Panlite L 1225MP) 100, 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) (acid value 0.06 mg KOH/g, purity 99%) 5, and PTFE (Polyflon MPA-FA 500) 0.2 part showed UL-94 flammability rating V-0, vs. V-1, for a test piece containing II with acid value 2.5 mg KOH/g.

IT 20544-37-0P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(halogen-free fireproofing agents for thermoplastic polycarbonate resin compns.)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L7 ANSWER 40 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52945 CAPLUS Full-text

DN 140:112462

TI halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds and their moldings

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF

DT Patent

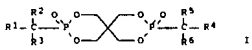
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018732	A	20040122	JP 2002-177295	20020618
PRAI JP 2002-177295		20020618		

OS MARPAT 140:112462

GI



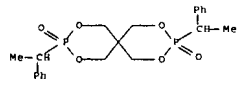
AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R4 = H, C1-5 aliphatic hydrocarbyl; R3, R6 = C1-5 aliphatic hydrocarbyl; R2, R5 = (un)substituted Ph, naphthyl, anthryl]. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-di- α-methylbenzyl-3,9-

dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 95%, and no burn marks.

IT 475101-74-7P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 475101-74-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L7 ANSWER 41 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52944 CAPLUS Full-text

DN 140:112461

TI Halogen-free heat- and fire-resistant transparent ABS resin-based compositions containing organophosphorus compounds and their moldings

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 33 pp.
CODEN: JKXXAF

DT Patent

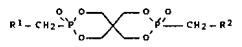
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018731	A	20040122	JP 2002-177294	20020618
PRAI JP 2002-177294		20020618		

OS MARPAT 140:112461

GI



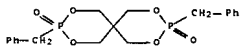
AB Title compns. contain 100 parts polymers containing ≥60% ABS and 1-100 parts organophosphorus compds. I [R1, R2 = (un)substituted Ph, naphthyl, anthryl] with acid value ≤0.7 mg KOH/g. Thus, a molding comprising 100 parts Santac UT 61 (ABS resin) and 15 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane-3,9-dibenzyl-3,9-dioxide showed UL-94 flammability rating V-2, heat distortion temperature retention 98%, and no burn marks.

IT 20544-37-0P

RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)
(heat- and fire-resistant transparent ABS resin-based compns. containing tetraoxadiphosphaspiroundecanes)

RN 20544-37-0 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L7 ANSWER 42 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52888 CAPLUS Full-text

DN 140:129118

TI Halogen-free styrene polymer compositions with good flowability and heat and fire resistance, and their moldings

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 25 pp.
CODEN: JKXXAF

DT Patent

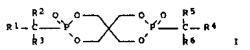
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018628	A	20040122	JP 2002-173997	20020614
PRAI JP 2002-173997		20020614		

OS MARPAT 140:129118

GI



AB The compns. comprise (A) 100 parts resins containing ≥50% styrene polymers and (B) 1-100 parts organic P compds. I (R1, R4 = H, C1-5-aliphatic hydrocarbon group, Ph, naphthyl, anthryl; R2, R3, R5, R6 = Ph, naphthyl, anthryl). Thus, a composition comprising 2,4,8,10-tetraoxa-3,9- diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-3,9-dioxide and a high-impact polystyrene (Styron H 9152) was injection-molded to give a test piece showing limiting O index (LOI) 21.7%, heat distortion temperature 82°, flowability (MVR) 32.4 cm3/10 min, and UL 94 fire resistance rating V2.

IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM

(Technical or engineered material use); PREP (Preparation); USES (Uses)
(fireproofing agent; pentaerythritol diphosphonate fireproofing agents for styrene polymer compns. with good flowability and heat resistance)

RN 475101-76-9 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L7 ANSWER 43 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52887 CAPLUS Full-text

DN 140:129117

TI Halogen-free styrene polymer compositions with good flowability and fire and heat resistance, and moldings using them

IN Yamanaka, Katsuhiro; Taketani, Yutaka

PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF

DT Patent

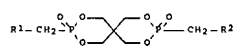
LA Japanese

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018625	A	20040122	JP 2002-173994	20020614
PRAI JP 2002-173994		20020614		

OS MARPAT 140:129117

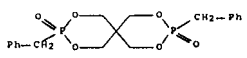
GI



AB The compns. comprise (A) styrene polymers 100, (B) polyphenylene ethers 1-100, and (C) organic P compds. I (R1, R2 = Ph, naphthyl, anthryl) 1-100 parts. Thus, a composition comprising 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dibenzyl-3,9-dioxide, a high-impact polystyrene (Styron H 9152), and polyphenylene ether (Zylon) was injection-molded to give a test piece showing limiting O index (LOI) 24.7%, heat distortion temperature 89°, flowability (MVR) 12.3 cm3/10 min, and UL 94 fire resistance rating V0.

IT 20544-37-0P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES

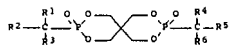
(Uses)
(fireproofing agent; pentaerythritol diphosphonate fireproofing agents for styrene polymer compns. with good flowability and heat resistance)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



L4 ANSWER 48 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52867 CAPLUS Full-text
DN 140:112448
TI Flame-retardant nonhalogen aromatic polyester compositions and their moldings
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 38 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018586	A	20040122	JP 2002-172651	20020613
PRAI JP 2002-172651		20020613		

OS MARPAT 140:112448
GI



I

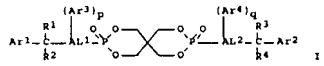
AB The compns. comprise (A) resins containing ≥60% aromatic polyesters 100, (B) organic P compds. I (R1, R4 = H, C1-5-aliphatic hydrocarbyl, Ph, naphthyl, anthryl; R2, R3, R5, R6 = Ph, naphthyl, anthryl) 1-100, (C) fireproofing resins 0-50, and (D) fillers 0-200 parts. Thus, a 1.6-mm-thick specimen from a composition of 100 parts TRB H (PBT) and 20 parts 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide (preparation described) showed UL 94 fire resistance rating V0 and LOI (limiting O index; JIS K 7201) 28.0.
IT 475101-76-9P, 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-bis(diphenylmethyl)-3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)

(fireproofing agents; spirodiphosphate-fireproofed aromatic polyester-based resin compns. free from halogens)
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L4 ANSWER 49 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52866 CAPLUS Full-text
DN 140:112203
TI Aromatic polyester composition containing organic phosphate fireproofing agent and molding of the composition
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 42 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018585	A	20040122	JP 2002-172650	20020613
PRAI JP 2002-172650		20020613		

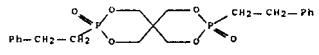
OS MARPAT 140:112203
GI



I

AB The composition contains 100 parts of a resin containing ≥60% of an aromatic polyester, 1-100 parts of the organic phosphate I (Ar1, Ar2 = Ph, naphthyl, anthryl; R1-R4 = H, C1-5 aliphatic hydrocarbyl, Ph, naphthyl, anthryl; AL1, AL2 = C1-5 branched or linear aliphatic hydrocarbyl; Ar3, Ar4 = Ph, naphthyl, anthryl; p, q = 0-3; each of Ar3 and Ar4 may be linked with AL1 and AL2; Ph, naphthyl, and anthryl may be substituted with aromatic ring) as the claimed fireproofing agent, 0-50 parts of a resin for improvement of fire resistance, and 0-200 parts of a filler. The composition is molded to give the halogen-free fire-resistant molding. Thus, 100 parts poly(butylene terephthalate) (TRB-H) and 15 parts 2,4,8,10-tetraoxa-3,9- diphophaspiro[5,5]undecane 3,9-di(2-phenylethyl)-3,9-dioxide were blended, mixed with chopped glass fiber, and injection-molded to give test pieces UL-94 flame retardance V-0 and limiting oxygen index (LOI) 27.5.

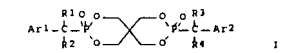
IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(aromatic polyester composition containing organic phosphate fireproofing agent for
halogen-free molding)
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L4 ANSWER 46 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52779 CAPLUS Full-text
DN 140:111522
TI Preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins
IN Yanagida, Takatsune; Tanabe, Seiichi; Imamura, Koichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018386	A	20040122	JP 2002-171212	20020612
PRAI JP 2002-171212		20020612		

OS CASREACT 140:111522; MARPAT 140:111522
GI

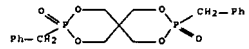


I

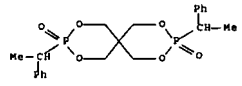
II

AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by heating II (Ar1, Ar2, R1-R4 = same as above) having purity ≥95% in the presence of halogenated compds. at 80-200°. Thus, II (R1-R4 = H, Ar1 = Ar2 = Ph; purity 98%) was heated in the presence of

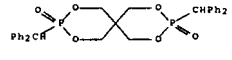
PhCH2Br at 150° to give I (R1-R4, Ar1, Ar2 = same as above) showing purity 99% with selectivity 95%.
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-74-7P 475101-76-9P, 3,9-Bis(benzhydryl)-2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as
fireproofing agents for resins by heating corresponding diphosphites with halogen compds.)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

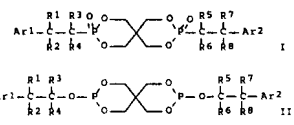


L4 ANSWER 47 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52778 CAPLUS Full-text
DN 140:111521
TI Preparation of low-volatile pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins
IN Imamura, Koichi; Tanabe, Seiichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018385	A	20040122	JP 2002-171211	20020612
PRAI JP 2002-171211		20020612		

OS CASREACT 140:111521; MARPAT 140:111521
GI



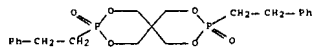
I

II

AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) are prepared by heating II (Ar1, Ar2, R1-R8 = same as above) in the presence of halogenated compds. at 120-250°. For decreasing content of residual volatile substances to ≤5000 ppm, the crude I may be washed with R5OH (R5 = C1-10 alkyl) at 50-120°. Thus, II (R1-R8 = H, Ar1 = Ar2 = Ph) was heated in the presence of Ph(CH2)2Br at 180°, filtered, refluxed with MeOH, washed with MeOH, and dried to give 87% I (R1-R8, Ar1, Ar2 = same as above) showing purity >99% and content of residual volatile substances 300 ppm.

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of low-volatile pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins by heating corresponding diphosphites with halogen compds.)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

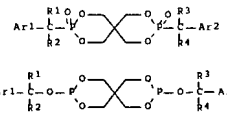


L1 ANSWER 53 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52777 CAPLUS Full-text

DN 140:111520
TI Preparation of low-volatile pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins
IN Imamura, Koichi; Tanabe, Seiichi; Yanagida, Takatsune; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018384	A	20040122	JP 2002-171210	20020612
PRAI JP 2002-171210		20020612		

OS CASREACT 140:111520; MARPAT 140:111520
GI



I

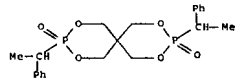
II

AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by heating II (Ar1, Ar2, R1-R4 = same as above) in the presence of halogenated compds. at 80-200°. For decreasing content of residual volatile substances to ≤5000 ppm, the crude I may be washed with R5OH (R5 = C1-10 alkyl) at 50-120°. Thus, II (R1-R4 = H, Ar1 = Ar2 = Ph) was heated in the presence of PhCH2Br at 150°, filtered, refluxed with MeOH, washed with MeOH, and dried to give 82% I (R1-R4, Ar1, Ar2 = same as above) showing purity >99% and content of residual volatile substances 500 ppm.

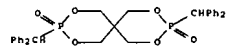
IT 20544-37-0P, 3,9-Dibenzyl-2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide 475101-74-7P 475101-76-9P, 3,9-Bis(diphenylmethyl)-2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of low-volatile pentaerythritol spirocyclic bis(phosphonate)s as fireproofing agents for resins by heating corresponding diphosphites with halogen compds.)

RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



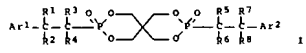
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L1 ANSWER 49 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52776 CAPLUS Full-text
DN 140:112200
TI Low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018381	A	20040122	JP 2002-171207	20020612
PRAI JP 2002-171207		20020612		

OS MARPAT 140:112200
GI

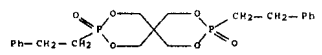


I

AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl; C1-20 hydrocarbyl) have content of residual volatile substances of ≤5000 ppm. Thus, pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Ar1 = Ar2 = Ph, R1-R8= H; residual volatile substance 400 ppm) were injection-molded to give a test piece showing fire resistance (UL 94) V-2. No deposition was observed in the injection mold after molding 500 times.

IT 62284-92-8P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L1 ANSWER 50 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52775 CAPLUS Full-text
DN 140:112199
TI Low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 15 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018380	A	20040122	JP 2002-171206	20020612
PRAI JP 2002-171206		20020612		

OS MARPAT 140:112199
GI

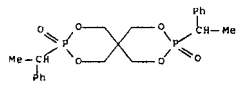
I

AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) have content of residual volatile substances of ≤5000 ppm. Thus, pellets comprising 100 parts Suntac UT 61 (ABS) and 15 parts I (Ar1 = Ar2 = Ph, R1-R4 = H; residual volatile substance 350 ppm) were injection-molded to give a test piece showing fire resistance (UL 94) V-2. No deposition was observed in the injection mold after molding 500 times.

IT 20544-37-0P 475101-74-7P 475101-76-9P
2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(low-volatile pentaerythritol spirocyclic diphosphonates as fireproofing agents for resins)

RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



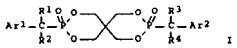
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L47 ANSWER 57 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:16971 CAPLUS Full-text
DN 140:94947

TI Preparation of pentaerythritol diphosphonates with low acid value
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004010586	A	20040115	JP 2002-169888	20020611
PRAI JP 2002-169888		20020611		

OS MARPAT 140:94947
GI

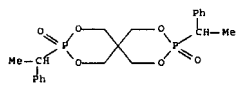


AB The title compds. I [Ar1, Ar2 = (un)substituted C6-20 aryl; R1-R4 = H, (un)substituted C6-20 aryl, (un)saturated C1-20 hydrocarbyl], having an acid value of ≤0.7 mg KOH/g and a purity of ≥94%, are prepared The compds. are especially useful as fireproofing agents for resins. Thus, a test piece prepared from 100 parts polybutylene terephthalate (TRB-H) and 20 parts 3,9-dibenzyl-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) (acid value 0.06 mg KOH/g, purity 99%) showed UL-94 flammability rating V-0, vs. V-2, for a test piece containing II with acid value 2.5 mg KOH/g.

IT 20544-37-0P 475101-74-7P 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(preparation of pentaerythritol diphosphonates with low acid value for fireproofing agents)

RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

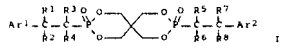


RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L47 ANSWER 59 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:32609 CAPLUS Full-text
DN 140:94927
TI Preparation of pentaerythritol diphosphonates with low yellowness index and good hue
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004010589	A	20040115	JP 2002-169891	20020611
PRAI JP 2002-169891		20020611		

OS MARPAT 140:94927
GI

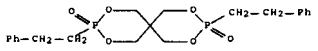


AB The title compds. I [Ar1, Ar2 = (un)substituted C6-20 aryl; R1-R8 = H, (un)substituted C6-20 aryl, C7-30 aralkyl, (un)saturated C1-20 hydrocarbyl] having yellowness index (YI) ≤8, L value ≥85, a value ≤0.5, and b value ≤4.0, are prepared The compds. are especially useful as fireproofing agents for resins. Thus, a test piece prepared from 100 parts polybutylene terephthalate (TRB-H) and 20 parts 3,9-di(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-

diphosphaspiro[5.5]undecane 3,9-dioxide (YI 1.08, L 95.95, a -0.17, b 0.53) showed UL-94 flammability rating V-0.

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(preparation of pentaerythritol diphosphonates with low yellowness index for fireproofing agents)

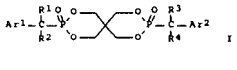
RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



L47 ANSWER 60 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:32608 CAPLUS Full-text
DN 140:94926
TI Preparation of pentaerythritol diphosphonates with low yellowness index and good hue
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004010588	A	20040115	JP 2002-169890	20020611
PRAI JP 2002-169890		20020611		

OS MARPAT 140:94926
GI



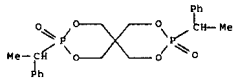
AB The title compds. I [Ar1, Ar2 = (un)substituted C6-20 aryl; R1-R4 = H, (un)substituted C6-20 aryl, (un)saturated C1-20 hydrocarbyl], having yellowness index (YI) ≤8, L value ≥85, a value ≤0.5, and b value ≤4.0, are prepared The compds. are especially useful as fireproofing agents for resins. Thus, a test piece prepared from 100 parts polybutylene terephthalate (TRB-H) and 20 parts 3,9-dibenzyl-2,4,8,10- tetraoxa-3,9-diphosphaspiro[5.5]undecane

3,9-dioxide (YI 3.10, L 95.57, a -0.27, b 1.65) showed UL-94 flammability rating V-0 and good hue.

IT 20544-37-0P 475101-74-7P 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(preparation of pentaerythritol diphosphonates with low yellowness index for fireproofing agents)

RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

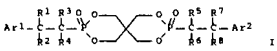


RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

L11 ANSWER 61 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:32607 CAPLUS Full-text
DN 140:94925
TI Preparation of pentaerythritol diphosphonates with low acid value
IN Taketani, Yutaka; Yamanaka, Katsuhiro; Imamura, Koichi; Tanabe, Seiichi
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 2004010587	A	20040115	JP 2002-169889	20020611
PRAI	JP 2002-169889		20020611		

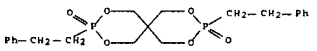
OS MARPAT 140:94925
GI



AB The title compds. I [Ar1, Ar2 = (un)substituted C6-20 aryl; R1-R8 = H, (un)substituted C6-20 aryl, C7-30 aralkyl, (un)saturated C1-20 hydrocarbyl], having an acid value of ≤0.7 mg KOH/g and a purity of ≥94%, are prepared. The compds. are especially useful as fireproofing agents for resins. Thus, a test piece prepared from 100 parts polybutylene terephthalate (TRB-H) and 20 parts 3,9-bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9- diphosphaspiro[5.5]undecane 3,9 dioxide (II) (acid value 0.03 mg KOH/g, purity 99%) showed UL-94 flammability rating V-0, vs. V-2, for a test piece containing II with acid value 1.3 mg KOH/g.

IT 62284-92-8P, 3,9-Bis(2-phenylethyl)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(preparation of pentaerythritol diphosphonates with low acid value for fireproofing agents)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

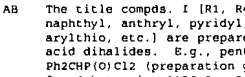


L11 ANSWER 62 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2003:752758 CAPLUS Full-text
DN 139:277001
TI Preparation of pentaerythritol diphosphonates and their use as fireproofing agents for polymers
IN Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

PI	JP 2003267984	A	20030925	JP 2002-66600	20020312
PRAI	JP 2002-66600		20020312		

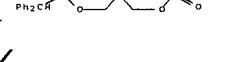
OS CASREACT 139:277001; MARPAT 139:277001
GI



AB The title compds. I [R1, R4 = H, Ar(R7)n; R2, R3, R5, R6 = Ar(R7)n; Ar = Ph, naphthyl, anthryl, pyridyl, thiazyl; n = 0-5; R7 = Me, Et, Pr, Bu, aryloxy, arylthio, etc.] are prepared by reaction of pentaerythritol with phosphonic acid dihalides. E.g., pentaerythritol (468.1 g) was esterified with 2058.5 g Ph2CHP(O)Cl2 (preparation given) in CHCl3 in the presence of pyridine at 60° for 6 h to give 1156.2 g I (R1 = R4 = H, R2 = R3 = R5 = R6 = Ph), which was added to polypropylene at 30 phr and injection-molded to give a test piece showing fire resistance (UL 94) V-2.

IT 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of pentaerythritol diphosphonates as fireproofing agents for polymers)

RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



See ref

L11 ANSWER 63 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2002:888823 CAPLUS Full-text
DN 137:370855
TI Flame-retardant polyester-based resin compositions containing organic phosphorous compounds and molded articles therefrom
IN Yamanaka, Katsuhiro; Taketani, Yutaka
PA Teijin Chemicals, Ltd., Japan
SO PCT Int. Appl., 95 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002092690	A1	20021121	WO 2002-JP4659	20020514
	W: CN, KR, US				

	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR				
	JP 2003034749	A	20030207	JP 2002-138136	20020514
	EP 1408085	A1	20040414	EP 2002-769597	20020514
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR				
	CN 1509314	A	20040630	CN 2002-810103	20020514
	JP 2003160722	A	20030606	JP 2002-165449	20020606
	JP 2003213109	A	20030730	JP 2002-165450	20020606
	US 2004127611	A1	20040701	US 2003-476390	20031031
	US 7087667	B2	20060808		
	US 2005256293	A1	20051117	US 2005-5152802	20050615
PRAI	JP 2001-144478	A	20010515		
	JP 2001-281268	A	20010917		
	JP 2001-347212	A	20011113		
	WO 2002-JP4659	W	20020514		
	US 2003-476390	A1	20031031		

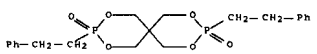
OS MARPAT 137:370855

AB Title compns. comprising (A) a resin component comprising ≥60 aromatic polyester resin 100, (B) a organophosphorus compound with acid value ≤0.7 mg-KOH/g, (C) a resin for improving flame retardancy 0-50, and (D) a filler 0-200 parts, are substantially halogen free, and meet UL94 V-2 or meet UL94 V-0 under suitable conditions. Thus, 6.81 parts pentaerythritol and 13.76 parts trichlorophosphine were reacted at 60° to give a 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane,3,9- dihydro-3,9-dioxide, 10.94 parts benzyl bromide was added therein to give a 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane,3,9-dibenzyl-3,9- dioxide with acid value 0.06 mg-KOH/g, 15 parts of which was mixed with 100 parts TRB-H to give a composition showing good flame retardancy.

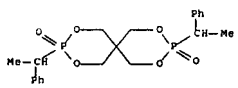
IT 20544-37-0P 62284-92-8P 475101-74-7P 475101-76-9P
RL: IMF (Industrial manufacture); MOA (Modifier or additive use); PREP (Preparation); USES (Uses)
(flame retardant; preparation of organic phosphorous flame retardants for halogen free flame-retardant polyester resin compns.)

RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)

RN 62284-92-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 475101-74-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



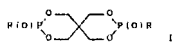
RN 475101-76-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(diphenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)

RE CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L24 ANSWER 59 OF 625 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1980:59635 CAPLUS Full-text
DN 92:59635
TI Pentaerythrityl diphosphonate-ammonium polyphosphate combinations as flame retardants for olefin polymers
IN Hardy, William B.; Min, Tae B.; Hoffman, Joseph A.
PA American Cyanamid Co., USA
SO U.S., 4 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

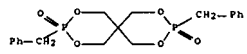
	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4174343	A	19791113	US 1978-903294	19780505
PRAI	US 1978-903294	A	19780505		

GI

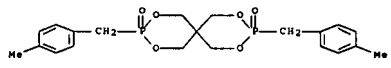


AB Certain pentaerythritol diphosphonates (I, R = Me, Ph, benzyl, CN), containing ammonium polyphosphate (except for R = CN), give self-extinguishing,

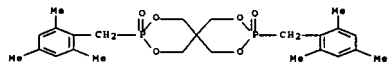
nondripping flame retardant compns. when added to polyolefins. Thus, polypropylene [9003-07-0] 70, dimethylpentaerythrityl diphosphonate [3001-98-7] 15, and ammonium polyphosphate 15 parts were extruded into cylindrical specimens which were exposed 10 s to a 3/4 in. blue flame. The samples did not ignite or melt drip.
IT 20544-37-0
RL: USES (Uses)
(flame retardants, containing ammonium polyphosphate, for polyolefins)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



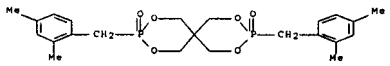
IT 71325-80-9P 71325-82-1P 72551-87-2P
72551-88-3P 72551-89-4P 72561-29-6P
RL: PREP (Preparation)
(preparation of)
RN 71325-80-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[(4-methylphenyl)methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)



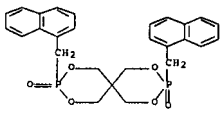
RN 71325-82-1 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[(2,4,6-trimethylphenyl)methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 72551-87-2 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[(2,4-dimethylphenyl)methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)

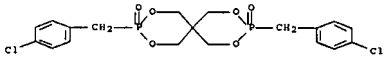


RN 72551-88-3 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-naphthalenylmethyl)-, 3,9-dioxide (9CI) (CA INDEX NAME)



RN 72551-89-4 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[(4-bromophenyl)methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)

RN 72561-29-6 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[(4-chlorophenyl)methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)

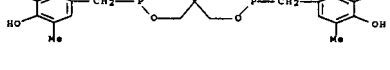


L24 ANSWER 59 OF 625 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1978:511298 CAPLUS Full-text
Correction of: 1975:565050
DN 89:111298
Correction of: 83:165050
TI Phosphonospirobisphenols as flame-resistant additives for resins

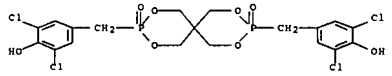
IN Mueller, Albrecht; Renner, Alfred
PA Ciba-Geigy A.-G., Switz.
SO Ger. Offen., 23 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 2456532	A1	19750605	DE 1974-2456532	19741129
	CH 582195	A5	19761130	CH 1973-16895	19731203
	ES 432497	A1	19761101	ES 1974-432497	19741202
	GB 1487609	A	19771005	GB 1974-52111	19741202
	FR 2253024	A1	19750627	FR 1974-39479	19741203
	JP 50084587	A	19750708	JP 1974-140105	19741203
PRAI	CH 1973-16895	A	19731203		

AB The compds. I with R = 4(or 2)-hydroxy-3,5-dimethyl(or dichloro)phenyl, 2-hydroxyphenyl, or 2-hydroxy-5-methylphenyl were prepared The compds. had good hydrolysis resistance and were useful as diglycidyl ethers, for preparing fire-resistant resins. Thus, 270 g (4-hydroxy-3,5-dimethylbenzyl)dimethylamine [42900-95-8] and 223 g trimethyl phosphite [121-45-9] in 1,4-dioxane were refluxed to prepare dimethyl (4-hydroxy-3,5-dimethylbenzyl)phosphonate [56733-62-1] which (48.8 g) was mixed with 13.6 g pentaerythritol [115-77-5] in sulfolane and heated at 250-280° to prepare I (R = 4-hydroxy-3,5-dimethylphenyl) (II) [56733-67-6]. A mixture of 99.2 g II, 1 L epichlorohydrin [106-89-8], and 4 g NEt4Br was heated to 90-100°, cooled to 80°, and treated during 1 h with 24 g NaOMe to prepare II diglycidyl ether [56733-68-7]. II and bisphenol A diglycidyl ether were used to prepare a nonburning resin.
IT 56733-67-6P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation and reaction of, with epichlorohydrin)
RN 56733-67-6 CAPLUS
CN Phenol, 4,4'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[2,6-dimethyl- (9CI) (CA INDEX NAME)

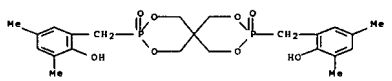


IT 56733-56-3P 56733-57-4P 56733-58-5P
56733-59-6P 56733-60-7P 56778-54-2P
RL: PREP (Preparation)
(preparation of)
RN 56733-56-3 CAPLUS
CN Phenol, 4,4'-[(2,4,8,10-tetraoxa-3,9-dioxido-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[2,6-dichloro- (9CI) (CA INDEX NAME)

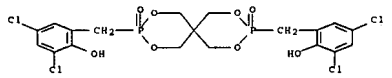


RN 56733-57-4 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis- (9CI) (CA INDEX NAME)

RN 56733-58-5 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4,6-dimethyl- (9CI) (CA INDEX NAME)

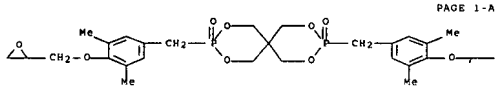


RN 56733-59-6 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4,6-dichloro- (9CI) (CA INDEX NAME)



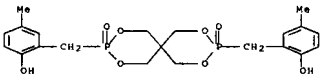
RN 56733-68-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[[3,5-dimethyl-4-(oxiranylmethoxy)phenyl]methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

RN 56778-54-2 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4-methyl- (9CI) (CA INDEX NAME)

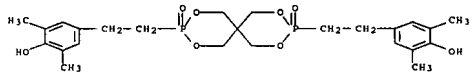


L1 ANSWER 59 OF 62 CAPLUS COPYRIGHT 2007 ACS ON STN
AN 1977:90946 CAPLUS Full-text
DN 86:90946
TI Hindered phenol pentaerythritol phosphonate
IN Hechenbleikner, Ingenuin; Enlow, William P.
PA Borg-Warner Corp., USA
SO Brit., 8 pp.
CODEN: BRXXAA
DT Patent
LA English
FAN.CNT 1

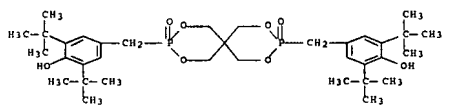
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI GB 1439092	A	19760609	GB 1974-16786	19740417
PRAI GB 1974-16786	A	19740417		

AB Three title compds. were manufactured which were useful as antioxidants and fire retardants for polymers and rubbers. Thus, a mixture of 256 g 3,9-dimethoxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane [7093-29-0] in 1 l. PhMe and 509 g 3,5-di-tert-butyl-4-hydroxybenzyl chloride [955-01-1] in 500 ml heptane was heated 3 hr at 100-10°, distilling off MeCl, cooled, filtered, and washed with PhMe to give 90% 3,9-bis(3,5-di-tert-butyl-4-hydroxybenzyl)-3,9-dioxo-2,4,8,10-tetraoxa-3,9- diphosphaspiro[5.5]undecane (I) [5[illegible]]. Polypropylene [9003-07-0] powder was stabilized by blending with 0.5% I.

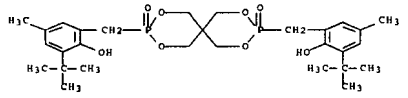
IT [illegible]
RL: USES (Uses)
(antioxidant, for polypropylene, manufacture of)
RN 53833-04-8 CAPLUS
CN Phenol, 4,4'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)di-2,1-ethanediyl]bis[2,6-dimethyl- (9CI) (CA INDEX NAME)



RN 53833-06-0 CAPLUS
CN Phenol, 4,4'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[2,6-bis(1,1-dimethylethyl)- (9CI) (CA INDEX NAME)



IT [illegible]
RL: PREP (Preparation)
(preparation of)
RN 53833-05-9 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[6-(1,1-dimethylethyl)-4-methyl- (9CI) (CA INDEX NAME)

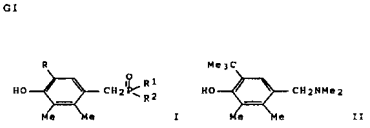


L1 ANSWER 60 OF 62 CAPLUS COPYRIGHT 2007 ACS ON STN
AN 1976:560318 CAPLUS Full-text
DN 85:160318

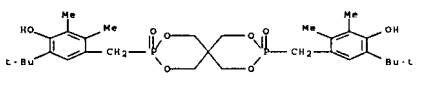
TI 2,3,5-Trialkyl-4-hydroxybenzyl phosphonates and phosphinates
IN Spivack, John D.
PA Ciba-Geigy Corp., USA
SO U.S., 11 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 2

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 3962377	A	19760608	US 1974-492089	19740726
ZA 7405384	A	19750827	ZA 1974-5384	19740821
BE 820259	A1	19750324	BE 1974-148819	19740924
FR 2244759	A1	19750418	FR 1974-32107	19740924
DK 7405021	A	19750602	DK 1974-5021	19740924
GB 1476994	A	19770616	GB 1974-41429	19740924
NL 7412670	A	19750327	NL 1974-12670	19740925
JP 50060481	A	19750524	JP 1974-110364	19740925
PRAI US 1973-400601	A2	19730925		

GI



AB The title compds. I [R = Me3C, Me3CCH2CMe2; R1 = R2 = EtO, BuO, MeO, Me(CH2)11O, Me(CH2)17O, Me(CH2)17CH2CH2O; R1 = Me(CH2)11O, R2 = Ph] were prepared Thus, II was heated with (MeO)2POH in DMF at 60° .apprx.20 hr to give I (R = Me3C, R1 = R2 = MeO). I are stabilizers for polymers subject to oxidative, thermal and photochem. degradation
IT 55719-69-2P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
RN 55719-69-2 CAPLUS
CN Phenol, 4,4'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[6-(1,1-dimethylethyl)-2,3-dimethyl- (9CI) (CA INDEX NAME)



L1 ANSWER 61 OF 62 CAPLUS COPYRIGHT 2007 ACS ON STN
AN 1975:565050 CAPLUS Full-text
DN 83:165050

? Can't find record in EAST, etc pulls up incorrect document

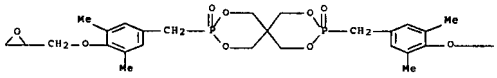
TI Phosphonospirobisphenols as flame-resistant additives for resins
IN Mueller, Albrecht; Renner, Alfred
PA Ciba-Geigy A.-G., Fed. Rep. Ger.
SO Ger. Offen., 23 pp.
CODEN: GWXXBX
DT Patent
LA German
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 2456523	A1	19760812	DE 1974-2456523	19741129
PRAI DE 1974-2456523	A	19741129		

GI For diagram(s), see printed CA Issue.
AB The compds. I with R = 4(or 2)-hydroxy-3,5-dimethyl(or dichloro)phenyl, 2-hydroxyphenyl, or 2-hydroxy-5-methylphenyl were prepared. The compds. had good hydrolysis resistance and were useful, e.g., as diglycidyl ethers, for preparing fire-resistant resins. Thus, 270 g (4-hydroxy-3,5-dimethylbenzyl)dimethylamine [42900-95-8] and 223 g tri-Me phosphite [121-45-9] in 1,4-dioxane were refluxed to prepare di-Me (4-hydroxy-3,5-dimethylbenzyl)phosphonate [56733-62-1] which (48.8 g) was mixed 13.6 g pentaerythritol [115-77-5] in sulfolane and heated at 250-280° to prepare I (R = 4-hydroxy-3,5-dimethylphenyl) (II) [56733-67-6]. A mixture of 99.2 g II, 1 l. epichlorohydrin [106-89-8], and 4 g NEt4Br was heated to 90-100°, cooled to 80°, and treated during 1 hr with 24 g NaOMe to prepare II diglycidyl ether [56733-68-7]. II and bisphenol A diglycidyl ether were used to prepare a nonburning resin.
IT 56733-62-1 & 56733-68-7
RL: USES (Uses)
(fire-resistant resins containing)
RN 56733-67-6 CAPLUS
CN Phenol, 4,4'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[2,6-dimethyl- (9CI) (CA INDEX NAME)

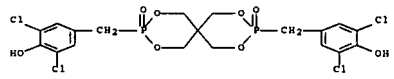
RN 56733-68-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis[[3,5-dimethyl-4-(oxiranylmethoxy)phenyl]methyl]-, 3,9-dioxide (9CI) (CA INDEX NAME)

PAGE 1-A

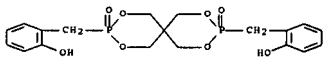


PAGE 1-B

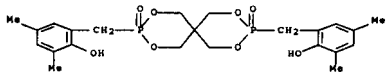
IT 56733-56-2 56733-57-4 56733-58-5
56733-59-6 56778-54-2
RL: USES (Uses)
(fireproofing agents, for resins)
RN 56733-56-3 CAPLUS
CN Phenol, 4,4'-[(2,4,8,10-tetraoxa-3,9-dioxido-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[2,6-dichloro- (9CI) (CA INDEX NAME)



RN 56733-57-4 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis- (9CI) (CA INDEX NAME)

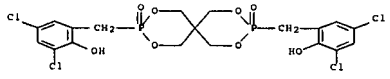


RN 56733-58-5 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4,6-dimethyl- (9CI) (CA INDEX NAME)

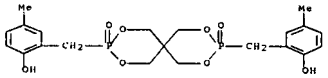


RN 56733-59-6 CAPLUS

CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4,6-dichloro- (9CI) (CA INDEX NAME)



RN 56778-54-2 CAPLUS
CN Phenol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(methylene)]bis[4-methyl- (9CI) (CA INDEX NAME)

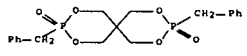


L41 ANSWER 62 OF 62 CAPLUS COPYRIGHT 2007 ACS on STN
AN 1960:496874 CAPLUS Full text
DN 69:96874
TI Cyclic esters of phosphonic acids
PA CIBA Ltd.
SO Fr., 20 pp.
CODEN: FRXXAK
DT Patent
LA French
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI FR 1503429		19671124	FR 1966-86604	19661208
PRAI CH		19651214		

GI For diagram(s), see printed CA Issue.
AB The title compds. which are used for modification and hardening of epoxy resins are prepared by treating compds. containing oxirane or oxetane rings with a phosphonic acid hemi-ester followed by internal transesterification of the hydroxy ester formed. Thus, 1096 g. EtJPO3 was heated 15-20 hrs. with 375 g. 1,4-dichloro-2-butene at 140 ± 5° until all EtCl was eliminated. The reaction mixture was fractionally distilled and a liquid major fraction (93.5%) was obtained at 149-52°/0.1-0.15 mm. This fraction (n2D0 1.4595) was hydrogenated for 6-7 hrs. in the presence of Pd-C or Raney Ni in dioxane. After separation of dioxane and hydrogenation catalysts, tetraethyl butanebisphosphonate (I) was obtained. I was heated 2 hrs. with 10% aqueous NaOH, and cooled to give a di-hemi-ester disodium salt, which was treated with Amberlite JR 120, decolorized with C, and filtered through kieselguhr to give 660-70 g. di-hemiester (II) in the form of a viscous colorless liquid. II was dissolved in absolute alc. and heated gently in the presence of 2 moles p-

toluidine for each mole II to give the di-p-toluidine salt (III), m. 137.8-8.6°. III could be converted to the free hemi-ester by cation exchange resins. The hemi-ester could be obtained without passing through III by treating the residue obtained after saponification with alc. and Me2CO, and cooling at -15° to -18° after decolorization to give 1,4-butanebis(monoethyl phosphonate) (IV), m. 73-3.9°. Similarly prepared were 1,2-ethane bis(monoethyl phosphonate), m. 47.8-8.6°; 1,5-pentanebis(monoethyl phosphonate), m. 67.7-8.2°; 2,2'-bis(di- and monoethylphosphono)diethyl ether; [p-(EtO)(HO)P(O)CH2C6H4]2O, m. 136.1-7.7°0; and p-xylylenebis(monoethyl phosphonate), m. 228.7°. A mixture of 39.06 g. butyl glycidyl ether and 60.06 g. monethyl benzylphosphoate was heated 1 hr. at 100° to give a mixed ester in the form of an oily liquid. This mixed ester was fractionally distilled to give 2-benzyl-4-butoxymethyl-1,3-dioxa-2-oxophospholane. The preparation of p-xylylene-2,2'-bis(4-phenoxy-1,3-dioxa-2-oxophospholane), m. 221-33°; 2-benzyl-4-hexyl-1,3-dioxa-2-oxophospholane (IVa), b0.2 162-4°; and 1,3-dioxa-2-vinyl-4-butoxymethyl-2-oxophospholane, b0.01 123°, are described. IV (41.12 g.) was heated 75 min. with 41.26 g. 3-ethyl-1-oxacyclobutyl-3-methyl benzyl ether at 200°, dissolved in alc., and treated with Amberlite JRA 68 to give 1,4-butanebis(1,3-dioxa-5-ethyl-5-benzyloxymethyl-2-oxophosphorinane), m. 136-8°. The prepns. of 1,3-dioxa-5-ethyl-5-benzyloxymethyl-2- benzyl-2-oxophosphorinane, m. 94.1-5.6, bis(1,3-dioxa-5-ethyl-2-benzyl-2-oxophosphorinan-5-ylmethyl) ether, m. 149-52°, and 2,4,8,10-tetraoxa-3,9-dioxo-3,9-diphosphaspiro[5.5]undecane, m. 259.5-60.1°, were given. Polyphosphonanes and polyphosphorinanes were prepared by treating IV with 2,2-bis(p-glycidyloxyphenyl)propane and bis(3-ethyl-1-oxacyclobutylmethyl) ether, resp. Polyepoxide resin (19.9 g.) and 13.7 g. IV were dissolved in HCONMe2 to a 50% solution, heated to 50°, cast into a film on an Al plate, and cured 2 hrs. at 150° to give a fireproof transparent and elastic film which is insol. in organic solvents.
IT 20544-37-0P
RL: SPN (Synthetic preparation); PREP (Preparation)
(preparation of)
RN 20544-37-0 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethyl)-, 3,9-dioxide (CA INDEX NAME)



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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	327.21	551.02
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-48.36	-48.36

SESSION WILL BE HELD FOR 120 MINUTES
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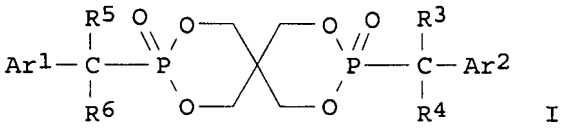
L10 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:589556 CAPLUS <<LOGINID::20070906>>
DN 141:124582
TI Process for production of pentaerythritol diphosphonates
IN Tanabe, Seiichi; Yanagida, Takatsune; Imamura, Koichi; Tando, Kazushi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO PCT Int. Appl., 54 pp.
CODEN: PIXXD2
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004060900	A1	20040722	WO 2003-JP16754	20031225
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2003292814	A1	20040729	AU 2003-292814	20031225
	EP 1586576	A1	20051019	EP 2003-768243	20031225
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
	CN 1735625	A	20060215	CN 2003-80108221	20031225
	US 2006116526	A1	20060601	US 2005-541021	20050628 <--
PRAI	JP 2003-177	A	20030106		
	WO 2003-JP16754	W	20031225		

OS MARPAT 141:124582
GI



I

AB A process for production of I (Ar1, Ar2 = aryl; R3-R6 = H, aryl, hydrocarbon group) useful as flame retardants comprises reacting PCl3 with pentaerythritol in the presence of an inert solvent to form pentaerythritol dichlorophosphite, reacting pentaerythritol dichlorophosphite with an aralkyl alc. to form a pentaerythritol diphosphite halide, and heat-treating pentaerythritol diphosphite halide at 80-300°. Thus, I (Ar1, Ar2 = Ph; R3-R6 = H) with high purity was prepared in high yield.

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=> d his

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     FILE 'CASREACT' ENTERED AT 16:20:54 ON 06 SEP 2007
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L3           0 S L1 SSS FULL

     FILE 'STNGUIDE' ENTERED AT 16:21:30 ON 06 SEP 2007

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L5           0 S L4
L6             STRUCTURE UPLOADED
L7          22 S L6

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L9          20 S L8

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L11         12 S L10

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     FILE 'STNGUIDE' ENTERED AT 16:35:59 ON 06 SEP 2007

     FILE 'REGISTRY' ENTERED AT 16:36:01 ON 06 SEP 2007
L12            STRUCTURE UPLOADED
L13          5 S L12
L14            STRUCTURE UPLOADED
L15          5 S L14
L16         53 S L14 SSS FULL

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L17        175 S L16
L18        143 S L17 AND PREP/RL

     FILE 'STNGUIDE' ENTERED AT 16:37:27 ON 06 SEP 2007

     FILE 'REGISTRY' ENTERED AT 16:39:43 ON 06 SEP 2007
L19            STRUCTURE UPLOADED
L20          3 S L19
L21         46 S L19 SSS FULL

     FILE 'CAPLUS' ENTERED AT 16:40:04 ON 06 SEP 2007
L22        101 S L21
L23         71 S L22 AND PREP/RL
L24         25 S L18 AND L23

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FILE 'CAPLUS' ENTERED AT 16:41:03 ON 06 SEP 2007
L25 2 S US200!-541021/APPS
L26 24 S L24 NOT L25

FILE 'REGISTRY' ENTERED AT 16:41:37 ON 06 SEP 2007

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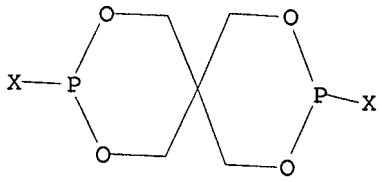
L14 STR



Structure attributes must be viewed using STN Express query preparation.

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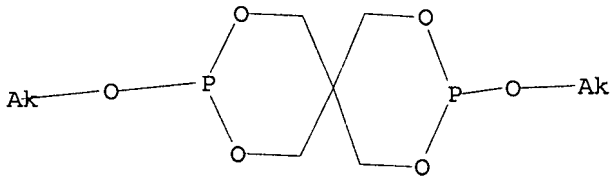
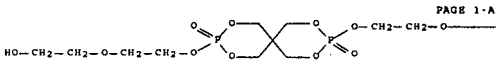
L19 HAS NO ANSWERS
L19 STR



Structure attributes must be viewed using STN Express query preparation.

L25 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2006:1178153 CAPLUS Full-text
DN 146:101607
TI A novel flame retardant of spirocyclic pentaerythritol bisphosphorate for epoxy resins
AU Chen, Gui-Hong; Yang, Bing; Wang, Yu-Zhong
CS Center for Degradable and Flame-Retardant Polymeric Materials, College of Chemistry, Sichuan University, Chengdu, 610064, Peop. Rep. China
SO Journal of Applied Polymer Science (2006), 102(5), 4978-4982
CODEN: JAPNAB; ISSN: 0021-8995
PB John Wiley & Sons, Inc.
DT Journal
LA English
AB A novel flame retardant for epoxy resins, bisdiglycol spirocyclic pentaerythritol bisphosphorate (BDSPBP) was prepared from the reaction of diethylene glycol with spirocyclic pentaerythritol bisphosphorate diphosphoryl chloride, which was obtained from the reaction of phosphoryl chloride with pentaerythritol. Flammability of the cured epoxy resin systems consisted of diglycidyl ether of bisphenol A (DGEBA), low-mol.-weight polyamide and BDSPBP are investigated by vertical burning test (UL-94) and limiting oxygen index test (LOI). The results indicate that BDSPBP has good flame retardance on epoxy. The thermogravimetric anal. (TGA) shows that the epoxy resin containing BDSPBP has a high yield of residual char at high temps., indicating that BDSPBP is an effective charring agent. From the SEM observations of the residues of the flame retardant systems burned, the compact charred layers can be seen, which form protective shields to protect effectively internal structure, and inhibit the transmission of heat and heat diffusion during contacting fire.
IT 917497-86-0P
RL: MOA (Modifier or additive use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)
(preparation of flame retardant spirocyclic pentaerythritol bisphosphorate for epoxy resins)
RN 917497-86-0 CAPLUS
CN Ethanol, 2,2'-[(3,9-dioxido-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis(oxy-2,1-ethanediyloxy)]bis- (CA INDEX NAME)

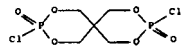
PAGE 1-A



PAGE 1-B

IT 714-87-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(preparation of flame retardant spirocyclic pentaerythritol bisphosphorate

for epoxy resins)
RN 714-87-4 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro-, 3,9-dioxide (CA INDEX NAME)



RE.CNT 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L26 ANSWER 2 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:489688 CAPLUS Full-text
DN 141:38738
TI Preparation of pentaerythritol diphosphites and diphosphonates
IN Yanagida, Takatsune; Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Tando, Kazushi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 26 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004168687	A	20040617	JP 2002-334943	20021119
PRAI JP 2002-334943		20021119		

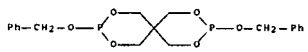
OS MARPAT 141:38738
GI

I

AB The diphosphites I [X1, X2 = OZAr; Ar = C6-20 (un)substituted aryl; Z = (un)substituted CH2, C2H4], useful as fireproofing agents, nucleating agents, plasticizers, antioxidants, etc. (no data), were prepared by reaction of pentaerythritol with PCl3 in inert solvents and reaction of the resulted solns. or suspensions of I (X1 = X2 = Cl) with ArZOH (Ar, Z = same as above) while bubbling inert gases. Pentaerythritol diphosphonates are prepared from the diphosphites by UV irradiation or heating in the presence of halogen compds. Pentaerythritol was treated with PCl3 in PhMe in the presence of pyridine and treated with benzyl alc. while bubbling N at room temperature for 60 min to give 90.1% I (X1 = X2 = OCH2Ph).
IT 3643-70-7P, Pentaerythritol dichlorophosphite 7093-28-9P , 3,9-Dibenzyloxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 475101-75-8P, 3,9-Bis(2-phenylethyloxy)-2,4,8,10-tetraoxa-3,9-

diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol diphosphites and diphosphonates)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)

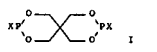


RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)-(9CI) (CA INDEX NAME)

L26 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:492956 CAPLUS Full-text
DN 141:7281
TI Preparation of pentaerythritol bis(phosphite)s
IN Yanagida, Takatsune; Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Tando, Kazushi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 29 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004149443	A	20040527	JP 2002-315548	20021030
PRAI JP 2002-315548		20021030		

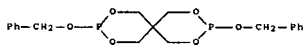
OS CASREACT 141:7281; MARPAT 141:7281
GI



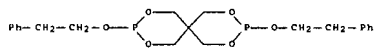
I

AB The title compds. I [X = OZAr; Z = (un)substituted CH2, (un)substituted C2H4; Ar = (un)substituted C6-20 aryl], useful as fireproofing agents, nucleating agents, plasticizers, antioxidants, etc., are prepared by reaction of PCl3 with pentaerythritol in inert solvents, heating the resulting solns. or suspensions of I (X = Cl) at 40-120°, and successive treatment with ArZOM (Ar, Z = same as I; M = alkali metal). Preparation of pentaerythritol bis(phosphonate)s from title compds. is also claimed. E.g., a suspension of I (X = Cl) in PhMe was treated with PhCH2ONa at room temperature for 60 min to give 98.9% I (X = OCH2Ph).
IT 3643-70-7P 7093-28-9P 475101-75-8P, 3,9-Bis[(2-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol bis(phosphite)s via condensation of bis(chlorophosphite)s with aralkyl alc. alkali metal salts)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)



RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)-(9CI) (CA INDEX NAME)



L26 ANSWER 4 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:271546 CAPLUS Full-text
DN 140:303859
TI Preparation of spiro-pentaerythritol diphosphites
IN Tando, Kazushi; Ando, Shinichi; Imamura, Koichi; Tanabe, Seiichi; Yanagida, Takatsune; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099567	A	20040402	JP 2002-266624	20020912
PRAI JP 2002-266624		20020912		

OS MARPAT 140:303859
GI

I

AB Title spiro compds. I [X1 = Ar2Z2O; X2 = Ar3Z3O; Ar2, Ar3 = C6-20 (un)substituted aryl; Z2, Z3 = CR7R8, CR9R10CR11R12; R7, R8 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R9-R12 = similar group as in R7, R8] are prepared by treatment of I (X1 = X2 = Cl) with Ar1Z1OH (Ar1 = C6-20 (un)substituted aryl; Z1 = similar group as in Z2 and Z3) in the presence of organic bases as HCl scavengers, filtering the reaction mixts. to remove the generated salts, and washing the filtrates with aqueous alkalies. After washing, the alkali wastes are reused for washing the products. Thus, I (X1 = X2 = Cl) was treated with PhCH2OH and pyridine in MePh, filtered, and the filtrate washed with aqueous NaOH to give 93% I (X1 = X2 = PhCH2O) with 96% purity. The aqueous NaOH waste was recovered and used again for washing another filtrate to give the product with same purity.
IT 7093-28-9P
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of spiro-pentaerythritol diphosphites, their purification by aqueous alkalies, and reusing the alkali wastes)
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)

IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of spiro-pentaerythritol diphosphites, their purification by aqueous alkalies, and reusing the alkali wastes)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 5 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:268555 CAPLUS Full-text
DN 140:304655
TI Preparation of spiro-pentaerythritol diphosphonates using recycled solvents
IN Tanabe, Seiichi; Ando, Shinichi; Imamura, Koichi; Tando, Kazushi; Yanagida, Takatsune; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 28 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PRAI JP 2002-266623		20020912		

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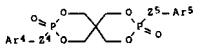

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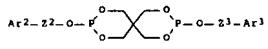
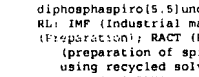
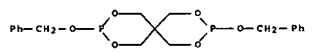


III

AB Title compds. I [Ar4, Ar5 = C6-20 (un)substituted aryl; Z4, Z5 = CR14R15, CR16R17CR18R19; R14, R15 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R16-R19 = similar group as in R14, R15], useful for fireproofing agents, etc., are prepared by chlorination of pentaerythritol (II) with PCl3 in the presence of inert solvents, successive treatment with Ar1Z1OH [Ar1 = C6-20 (un)substituted aryl; Z1 = similar group as in Z4, Z5] in the presence of organic bases, removal of the bases, their salts, and the solvents, and treatment of the resulting spiro-pentaerythritol diphosphites III (Ar2, Ar3 = similar group as in Ar1; Z2, Z3 = similar group as in Z1) with R13X (R13 = alkali metal, C1-20 alkyl, aralkyl, aryl, etc.; X = Br, iodine) at 80-300°. The removed solvents are recovered and reused in the above process. Thus, II was chlorinated with PCl3 in pyridine and xylene, condensed with PhCH2OH, filtered, the filtrate washed with 1N NaOH, the organic phase evaporated, and refluxed with PhCH2Br to give 89% I (Ar4Z4 = Ar5Z5 = PhCH2) with >99% purity. II was similarly reacted in recovered solvent to give the product without decline in yield or purity.
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 7093-28-9P
RL: IMF (Industrial manufacture); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)
(preparation of spiro-pentaerythritol diphosphonates from pentaerythritol using recycled solvents)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)



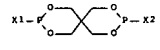
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)



L26 ANSWER 6 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:268536 CAPLUS Full-text
DN 140:303854
TI Preparation of spiro-pentaerythritol diphosphites in presence of recyclable hydrogen chloride scavengers
IN Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 18 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004099500	A	20040402	JP 2002-262497	20020909
PRAI JP 2002-262497		20020909		

OS CASREACT 140:303854; MARPAT 140:303854
GI



I

AB Title spiro compds. I [X1 = Ar2Z2O; X2 = Ar3Z3O; Ar2, Ar3 = C6-20 (un)substituted aryl; Z2, Z3 = CR7R8, CR9R10CR11R12; R7, R8 = H, C6-20 (un)substituted aryl, C1-20 (un)saturated hydrocarbyl; R9-R12 = similar group as in R7, R8] are prepared by treatment of I (X1 = X2 = Cl) with Ar1Z1OH (Ar1 = C6-20 (un)substituted aryl; Z1 = similar group as in Z2 and Z3) in the presence of organic bases with water solubility ≤1 weight% at 20° and 1 atom as HCl scavengers. Thus, I (X1 = X2 = Cl) was treated with PhCH2OH and PhNMe2 in MePh at 20° for 30 min to give 93% I (X1 = X2 = PhCH2O) and to recover 96% PhNMe2.
IT 7093-28-9P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of spiro-pentaerythritol diphosphites in presence of water-insol. tertiary amines as recyclable HCl scavengers)
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)

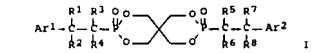
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of spiro-pentaerythritol diphosphites in presence of water-insol. tertiary amines as recyclable HCl scavengers)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 7 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:217191 CAPLUS Full-text
DN 140:253718
TI Preparation of high-purity pentaerythritol spirocyclic diphosphonates without purification of intermediates
IN Tanabe, Seiichi; Yanagida, Takatsune; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004083538	A	20040318	JP 2002-263848	20020910
PRAI JP 2002-194712	A	20020703		

OS CASREACT 140:253718; MARPAT 140:253718
GI



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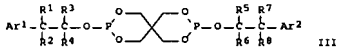


III

AB The diphosphonates I (Ar1, Ar2 = C6-20 aryl, R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl), useful as polymer fireproofing agents, are prepared by treatment of pentaerythritol (II) with PCl3 in nonreactive solvents, treatment of the reaction mixts. with ArCR1R2Cr3/R4OH (Ar = C6-20 aryl, R1-R4 = same as above) in the presence of organic bases, removal of the organic bases and their salts from the reaction mixts. containing diphosphites III (Ar1, Ar2, R1-R8 = same as above), and heating the reaction mixts. in the

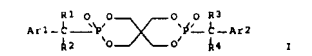
presence of RX (R = alkali metal, C1-20 alkyl, aralkyl, etc; X = Br, iodide) at 80-300°. Thus, II was treated with PCl3 in o-dichlorobenzene, treated with PhCH2CH2OH in the presence of pyridine, filtered, and the filtrate was washed with aqueous NaOH solution and heated in the presence of PhCH2CH2Br at 130° to give 90.3% I (R1-R8 = H, Ar1 = Ar2 = Ph) with purity 99.3%.
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 475101-75-8P, 3,9-Bis[(2-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of high-purity pentaerythritol spirocyclic diphosphonates as polymer fireproofing agents without purification of intermediates)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)- (9CI) (CA INDEX NAME)

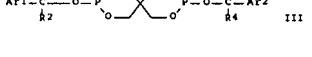
L26 ANSWER 8 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:217190 CAPLUS Full-text
DN 140:253717
TI Preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s without purification of intermediates
IN Tanabe, Seiichi; Yanagida, Takatsune; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 24 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004083537	A	20040318	JP 2002-263847	20020910
PRAI JP 2002-194711	A	20020703		

OS CASREACT 140:253717; MARPAT 140:253717
GI

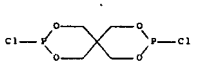


I



III

AB The title bis(phosphonate)s I (Ar1, Ar2 = C6-20 aryl, R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl), useful as polymer fireproofing agents, are prepared by treatment of pentaerythritol (II) with PCl3 in nonreactive solvents, treatment of the reaction mixts. with ArCR1R2OH (Ar = C6-20 aryl, R1, R2 = same as above) in the presence of organic bases, removal of the organic bases and their salts from the reaction mixts. containing diphosphites III (Ar1, Ar2, R1-R4 = same as above), and heating the reaction mixts. in the presence of RX (R = alkali metal, C1-20 alkyl, aralkyl, etc; X = Br, iodide) at 80-300°. Thus, II was sequentially treated with PCl3 in xylene and with PhCH2OH in the presence of pyridine, filtered, and the filtrate was washed with aqueous NaOH solution and then heated in the presence of PhCH2Br at 130° to give 90.6% I (R1-R4 = H, Ar1 = Ar2 = Ph) with purity 99.1%.
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 7093-28-9P
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of high-purity pentaerythritol spirocyclic bis(phosphonate)s as
polymer fireproofing agents without purification of intermediates)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)



RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)- (9CI) (CA INDEX NAME)

L26 ANSWER 9 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:97533 CAPLUS Full-text
DN 140:146290

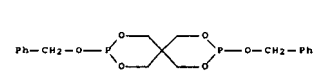
TI Environmentally friendly preparation of pentaerythritol spirocyclic diphosphites from their corresponding dichlorophosphite
IN Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035465	A	20040206	JP 2002-194713	20020703
PRAI JP 2002-194713		20020703		

OS CASREACT 140:146290; MARPAT 140:146290
GI

I

AB The title diphosphites I (X = OCR1R2Ar1; Y = OCR3R4Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by treatment of I (X, Y = Cl) with ArCR1R2OH (Ar = C6-20 aryl; R1, R2 = same as above) in the presence of organic bases as HCl scavengers, filtration of the resulting organic HCl salts, and washing of the filtrates with alkaline solns., wherein organic bases are recovered from the resulting alkaline waste solns. Thus, pentaerythritol was treated with PCl3 in the presence of NEt3 and substituted with PhCH2OH in the presence of NEt3 to give 95% I (X = Y = OCH2Ph), which was filtered and the filtrate was washed with 1 N aqueous NaOH solution and water. NaOH pellets were added to the waste aqueous NaOH solution, filtered, and distilled to recover 95% NEt3 with purity of 95%.
IT 7093-28-9P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(recovery of organic base HCl scavengers from waste alkaline solns. in environmentally friendly preparation of pentaerythritol spirocyclic diphosphite by substitution of the corresponding bis(chlorophosphite) with aralkyl alcs.)
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)- (9CI) (CA INDEX NAME)



IT 3643-70-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)
(recovery of organic base HCl scavengers from waste alkaline solns. in environmentally friendly preparation of pentaerythritol spirocyclic diphosphite by substitution of the corresponding bis(chlorophosphite) with aralkyl alcs.)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 10 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:92255 CAPLUS Full-text
DN 140:146289
TI Environmentally friendly preparation of pentaerythritol spirocyclic diphosphites from their corresponding dichlorophosphite
IN Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004035468	A	20040226	JP 2002-194716	20020703
PRAI JP 2002-194716		20020703		

OS CASREACT 140:146289; MARPAT 140:146289
GI

AB The title diphosphites I (X = OCR3R4CR1R2Ar1; Y = OCR5R6CR7R8Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) are prepared by treatment of I (X, Y = Cl) with ArCR1R2CR3R4OH (Ar = C6-20 aryl; R1-R4 = same as above) in the presence of organic bases as HCl scavengers, filtration of the resulting organic HCl salts, and washing of the filtrates with alkaline solns., wherein organic bases are recovered from the resulting alkaline waste solns. Thus, pentaerythritol was treated with PCl3 in the presence of NEt3 and substituted with PhCH2CH2OH in the presence of NEt3 to give 95% I (X = Y = OCH2CH2Ph), which was filtered and the filtrate was washed with 1 N aqueous NaOH solution and water. NaOH pellets were added to the

waste aqueous NaOH solution, filtered, and distilled to recover 95% NEt3 with purity of 95%.
IT 475101-75-8P
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(recovery of organic base HCl scavengers from waste alkaline solns. in environmentally friendly preparation of pentaerythritol spirocyclic diphosphite by substitution of the corresponding bis(chlorophosphite) with aralkyl alcs.)
RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)-(9CI) (CA INDEX NAME)

IT 3643-70-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(recovery of organic base HCl scavengers from waste alkaline solns. in environmentally friendly preparation of pentaerythritol spirocyclic diphosphite by substitution of the corresponding bis(chlorophosphite) with aralkyl alcs.)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 11 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:57504 CAPLUS Full-text
DN 140:111531
TI Preparation of high-purity pentaerythritol spirocyclic diphosphites without isolation of dichloride intermediate
IN Tando, Kazushi; Tanabe, Seiichi; Yanagida, Takatsune; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018406	A	20040122	JP 2002-172653	20020613
PRAI JP 2002-172653		20020613		

OS CASREACT 140:111531; MARPAT 140:111531
GI

AB The title diphosphites I (X = OCR1R2Ar1; Y = OCR3R4Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by heating solns. or suspensions of I (X, Y = Cl; manufactured from pentaerythritol and PCl3) at 40-120° under an inert atmospheric, followed by treatment with ArCR1R2OH (Ar = C6-20 aryl; R1, R2 = same as above) in the presence of organic bases as HCl scavengers. Thus, 20.1 mmol pentaerythritol (Pentarit S) was treated with 41.8 mmol PCl3 in the presence of 1.0 mmol pyridine in toluene under a N atmospheric to give a suspension, which was heated at 80°, cooled, treated with 40.3 mmol PhCH2OH in the presence of 42.5 mmol pyridine to give I (X = Y = OCH2Ph) with selectivity 93.5%.
IT 7093-28-9P, 3,9-Bis[(phenylmethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 647807-03-2P, 3,9-Bis[(1-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and
substitution with aralkyl alcs. in the presence of organic base HCl scavengers)
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)

RN 647807-03-2 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethoxy)-(9CI) (CA INDEX NAME)

IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: RCT (Reactant); SPN (Synthetic preparation); PREP

(Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and
substitution with aralkyl alcs. in the presence of organic base HCl scavengers)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 12 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:57503 CAPLUS Full-text
DN 140:111530
TI Preparation of storage-stable and high-purity pentaerythritol spirocyclic bis(phosphite)s
IN Yanagida, Takatsune; Tanabe, Seiichi; Tando, Kazushi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

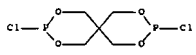
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018388	A	20040122	JP 2002-171214	20020612
PRAI JP 2002-171214		20020612		

OS CASREACT 140:111530; MARPAT 140:111530
GI

AB The title bis(phosphite)s I (X = OCR1R2Ar1; Y = OCR3R4Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by substitution of I (X, Y = Cl) with ArCR1R2OH (Ar = C6-20 aryl; R1, R2 = same as above) in the presence of organic bases as HCl scavengers from -20 to 100° at normal pressure under an inert atmospheric Thus, I (X = Y = Cl) was treated with 200 mol% PhCH2OH in the presence of 200 mol% pyridine in toluene under a dry N atmospheric and filtered to remove pyridine-HCl salt, and the filtrate was washed with 0.5 N NaOH solution and water, dried, and concentrated to give 95% I (X = Y = OCH2Ph) with purity 95% and purity retention 100% after storage under dry N for 2 wk.

IT 7093-28-9P
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphite)s by substitution of the corresponding dichloride with aralkyl alcs. in the presence of organic base HCl scavengers under an inert atmospheric)
RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)- (9CI) (CA INDEX NAME)

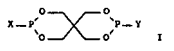
IT [illegible]
RL: RCT (Reactant); SPN (Synthetic preparation); PREP [illegible]; RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic bis(phosphite)s by substitution of the corresponding dichloride with aralkyl alcs. in the presence of organic base HCl scavengers under an inert atmospheric)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)



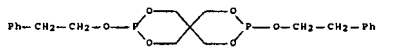
L26 ANSWER 16 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55607 CAPLUS Full-text
DN 140:111529
TI Preparation of storage-stable and high-purity pentaerythritol spirocyclic diphosphites without isolation of dichloride intermediate
IN Yanagida, Takatsune; Tanabe, Seiichi; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018410	A	20040122	JP 2002-172657	20020613
JP 2002-172657		20020613		

OS CASREACT 140:111529; MARPAT 140:111529
GI



AB The title diphosphites I (X = OCR3R4CR1R2Ar1; Y = OCR5R6CR7R8Ar2; Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) are prepared by heating solns. or suspensions of I (X, Y = Cl; manufactured from pentaerythritol and PCl3) at 40-120° under an inert atmospheric, followed by treatment with ArCR1R2CR3R4OH (Ar = C6-20 aryl; R1, R2 = same as above) in the presence of organic bases as HCl scavengers from -20 to 100° in inert atmospheric Thus, 200.5 mmol pentaerythritol was treated with 417.6 mmol PCl3 in the presence of 9.9 mmol pyridine (II) in toluene under a N atmospheric to give a suspension, which was heated at 80°, cooled, treated with 401.1 mmol Ph(CH2)2OH in the presence of 425.4 mmol II at 20°, and filtered to remove II-HCl salt, and the filtrate was washed with 0.5 N NaOH solution and water, dried, and condensed to give 94% I (X = Y = O(CH2)2Ph) with purity 97% and purity retention 100% after storage in dry N for 2 wk.
IT 475101-75-8P, 3,9-Bis[(2-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and
substitution with aralkyl alcs. in the presence of organic base HCl scavengers)
RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)- (9CI) (CA INDEX NAME)



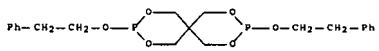
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and
substitution with aralkyl alcs. in the presence of organic base HCl scavengers)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 15 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:55606 CAPLUS Full-text
DN 140:111528
TI Preparation of storage-stable and high-purity pentaerythritol spirocyclic bis(phosphite)s
IN Tando, Kazushi; Tanabe, Seiichi; Imamura, Koichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018405	A	20040122	JP 2002-172652	20020613
JP 2002-172652		20020613		

OS CASREACT 140:111528; MARPAT 140:111528
GI

AB The title bis(phosphite)s I (X = OCR3R4CR1R2Ar1; Y = OCR5R6CR7R8Ar2; Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) are prepared by substitution of I (X, Y = Cl) with ArCR1R2CR3R4OH (Ar = C6-20 aryl; R1-R4 = same as above) in the presence of organic bases as HCl scavengers from -20 to 100° at normal pressure under an inert atmospheric Thus, I (X = Y = Cl) was treated with 200 mol% PhCH2CH2OH in the presence of 200 mol% pyridine in toluene under dry N atmospheric and filtered to remove pyridine-HCl salt, and the filtrate was washed with 0.5 N NaOH solution and water, dried, and concentrated to give 95% I (X = Y = OCH2Ph) with purity 94% and purity retention 100% after storage in dry N for 2 wk.
IT 475101-75-8P
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic bis(phosphite)s by substitution of the corresponding dichloride with aralkyl alcs. in the presence of organic base HCl scavengers under an inert atmospheric)
RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)- (9CI) (CA INDEX NAME)

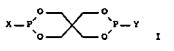


IT 3643-70-7P
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic bis(phosphite)s by substitution of the corresponding dichloride with aralkyl alcs. in the presence of organic base HCl scavengers under an inert atmospheric)
RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 15 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN
AN 2004:52790 CAPLUS Full-text
DN 140:111525
TI Preparation of high-purity and storage-stable pentaerythritol spirocyclic diphosphites without isolation of dichloride intermediate
IN Tanabe, Seiichi; Yanagida, Takatsune; Tando, Kazushi; Imamura, Koichi; Ando, Shinichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 17 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004018409	A	20040122	JP 2002-172656	20020613
JP 2002-172656		20020613		

OS CASREACT 140:111525; MARPAT 140:111525
GI

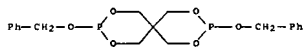


AB The title diphosphites I (X = OCR1R2Ar1; Y = OCR3R4Ar2; Ar1, Ar2 = C6-20 aryl; R1-R4 = H, C6-20 aryl, C1-20 hydrocarbyl) are prepared by heating solns. or suspensions of I (X, Y = Cl; manufactured from pentaerythritol and PCl3) at 40-120° under an inert atmospheric, followed by treatment with ArCR1R2OH (Ar =

C6-20 aryl; R1, R2 = same as above) in the presence of organic bases as HCl scavengers from -20 to 100° under inert atmospheric Thus, 201. mmol pentaerythritol was treated with 415.2 mmol PCl3 in the presence of 10.0 mmol pyridine (II) in toluene under a N atmospheric to give a suspension, which was heated at 60°, cooled, treated with 401.0 mmol PhCH2OH in the presence of 425.5 mmol II at 15-20°, and filtered to remove II-HCl salt, and the filtrate was washed with 0.5 N NaOH solution and water, dried, and condensed to give 95% I (X = Y OCH2Ph) with purity 97% and purity retention 100% after storage in dry N for 2 wk.

IT 7093-28-9P, 3,9-Bis[(phenylmethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 647807-03-2P, 3,9-Bis[(1-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); PUR (Purification or recovery); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and substitution with aralkyl alcs. in the presence of organic base HCl scavengers)

RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)



RN 647807-03-2 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(1-phenylethoxy)-(9CI) (CA INDEX NAME)

IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and substitution with aralkyl alcs. in the presence of organic base HCl scavengers)

RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 16 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52789 CAPLUS Full-text
DN 140:111524
TI Preparation of 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane having good stability as intermediate for phosphite antioxidant for resins
IN Tando, Kazushi; Tanabe, Seiichi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 9 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018408	A	20040122	JP 2002-172655	20020613
PRAI JP 2002-172655		20020613		

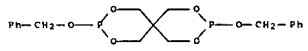
OS CASREACT 140:111524
AB 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane (I) is prepared by treatment of PCl3 (II) with pentaerythritol (III) in organic solvents, heating the resulting solns. or suspensions at 40-120° under an inert atmospheric without isolation of I, and cooling. Thus, 42.0 mmol II was treated with 20.2 mmol III (Pentarit S) in the presence of pyridine in toluene under N, heated at 60°, and cooled to give a suspension containing I with selectivity 96.5%. Then, pyridine and PhCH2OH were added to the suspension to give 3,9-bis(phenylmethyloxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane with selectivity 94.3%.
IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of dichlorotetraoxadiphosphaspiroundecane having good stability as intermediate for phosphite antioxidants by treatment of PCl3 with pentaerythritol and then heating)

RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

IT 7093-28-9P, 3,9-Bis(phenylmethyloxy)-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)

(preparation of dichlorotetraoxadiphosphaspiroundecane having good stability as intermediate for phosphite antioxidants by treatment of PCl3 with pentaerythritol and then heating)

RN 7093-28-9 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(phenylmethoxy)-(9CI) (CA INDEX NAME)



L26 ANSWER 17 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 2004:52788 CAPLUS Full-text
DN 140:111523
TI Preparation of high-purity pentaerythritol spirocyclic diphosphites without isolation of dichloride intermediate
IN Yanagida, Takatsune; Tanabe, Seiichi; Tando, Kazushi; Taketani, Yutaka
PA Teijin Chemicals Ltd., Japan
SO Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI JP 2004018407	A	20040122	JP 2002-172654	20020613
PRAI JP 2002-172654		20020613		

OS CASREACT 140:111523; MARPAT 140:111523
GI

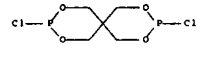
AB The title diphosphites I (X = OCR3R4CR1R2Ar1; Y = OCR5R6CR7R8Ar2; Ar1, Ar2 = C6-20 aryl; R1-R8 = H, C6-20 aryl, C7-30 aralkyl, C1-20 hydrocarbyl) are prepared by heating solns. or suspensions of I (X, Y = Cl; manufactured from pentaerythritol and PCl3) at 40-120° under an inert atmospheric, followed by treatment with ArCR1R2CR3R4OH (Ar = C6-20 aryl; R1-R4 = same as above) in the presence of organic bases as HCl scavengers. Thus, 40.1 mmol pentaerythritol (Pentarit S) was treated with 83.5 mmol PCl3 in the presence of 2.0 mmol pyridine in toluene under a N atmospheric to give a suspension, which was heated at 80°, cooled, treated with 80.2 mmol PhCH2CH2OH in the presence of 85.1 mmol pyridine to give I (X = Y = OCH2CH2Ph) with selectivity 93.0%.
IT 475101-75-8P, 3,9-Bis[(2-phenylethyl)oxy]-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane

RL: IMF (Industrial manufacture); SPN (Synthetic preparation); PREP (Preparation)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and substitution with aralkyl alcs. in the presence of organic base HCl scavengers)

RN 475101-75-8 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-phenylethoxy)-(9CI) (CA INDEX NAME)

IT 3643-70-7P, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)
(preparation of pentaerythritol spirocyclic diphosphites by heating solns. or suspensions of the corresponding dichloride under an inert atmospheric and substitution with aralkyl alcs. in the presence of organic base HCl scavengers)

RN 3643-70-7 CAPLUS
CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

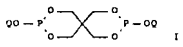


L26 ANSWER 18 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1994:657137 CAPLUS Full-text
DN 121:257137
TI Carbohydrate-substituted 2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane stabilizers
IN Babiarz, Joseph E.; Pastor, Stephen D.
PA Ciba-Geigy Corp., USA
SO U.S., 10 pp.
CODEN: USXXAM
DT Patent
LA English
FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI US 5310891	A	19940510	US 1992-918326	19920722
PRAI US 1992-918326		19920722		

OS MARPAT 121:257137
GI



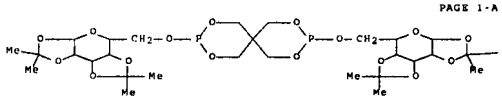
AB The stabilizers have the structure I (Q = carbohydrate residue). A solution of 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane in PhMe was treated dropwise with 1,2:5,6-di-O-isopropylidene-D-glucose and Et3N to give a I. Profax 6501 containing Ca stearate 0.075, pentaerythritol tetrakis(3,5-di-tert-butyl-4-hydroxyhydrocinnamate) 0.075, and the I 0.075% showed melt flow rate 2.5 (4.3) g/10 min after 1 (5) extrusion cycles at 274° with 90 s residence time, compared with 4.4 (10.7) g/10 min when the I was omitted.

IT 158868-45-8P
RL: PREP (Preparation)
(preparation of, as heat stabilizer for polypropylene)

RN 158868-45-8 CAPLUS

CN α-D-Galactopyranose, 6,6'-O-(2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diyl)bis[1,2:3,4-bis-O-(1-methylethylidene)- (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

—Me

IT 3643-70-7, 3,9-Dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with carbohydrates)

RN 3643-70-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 19 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1986:498557 CAPLUS Full-text

DN 105:98557

TI Derivatives of alkyl-substituted 4-hydroxy-methylpiperidine and their use as stabilizers

IN DiBattista, Piero; Nucida, Gilberto

PA Ausimont S.p.A., Italy

SO Eur. Pat. Appl., 51 pp.
CODEN: EPXXDW

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 163245	A2	19851204	EP 1985-106231	19850521
	EP 163245	A3	19861105		
	EP 163245	B1	19910731		
	R: BE, CH, DE, FR, GB, LI, NL				
	CA 1264743	A1	19900123	CA 1985-481955	19850521
	JP 61056164	A	19860320	JP 1985-108488	19850522
	US 4772708	A	19880920	US 1987-28039	19870320
PRAI	IT 1984-21034	A	19840522		
	US 1985-736328	A1	19850521		

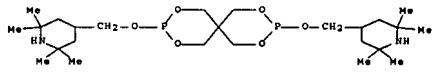
OS MARPAT 105:98557

AB Alkyl-substituted hydroxymethylpiperidine derivs. are useful as heat, light, and oxidation stabilizers for plastics. Thus, 2,2,6,6-tetramethyl-4-hydroxymethyl piperidine, prepared by hydrogenation of 2,2,6,6-tetramethylpiperidyl-4-spirooxirane, was transesterified with Me adipate, giving bis(2,2,6,6-tetramethyl)-4-methylpiperidine adipate (I). Polypropylene, stabilized by 0.5% I, had embrittlement time 3800 h, vs. 100 without I.

IT 103928-44-5P
RL: PREP (Preparation)
(preparation of, as stabilizer for polymers)

RN 103928-44-5 CAPLUS

CN Piperidine, 4,4'-[2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-diylbis(oxymethylene)]bis[2,2,6,6-tetramethyl- (9CI) (CA INDEX NAME)



IT 3643-70-7
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with hydroxymethylpiperidine compds.)

RN 3643-70-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L26 ANSWER 20 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1979:7681 CAPLUS Full-text

DN 90:7681

TI Intumescent fire retardant compositions containing pentaerythritol cyclic diphosphates

IN Albright, James A.

PA Velsicol Chemical Corp., USA

SO U.S., 6 pp. Cont.-in-part of U.S. 3,978,167.
CODEN: USXXAM

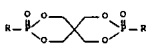
DT Patent

LA English

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 4099975	A	19780711	US 1976-650282	19760119
	US 3978167	A	19760831	US 1975-616935	19750926
PRAI	US 1974-429607	A2	19740102		
	US 1975-616935	A2	19750926		

GI



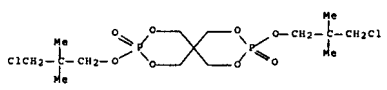
I

AB Pentaerythritol cyclic diphosphates (I, R = haloalkoxy, diethylamino) were prepared as intumescent agents for coatings. Thus, 30 g diethylamine [109-89-7] in 50 mL C6H6 was added to 29.7 g 3,9-dichloro-2,4,8,10- tetraoxa-3,9-diphosphaspiro(5.5)undecane-3,9-dioxide [714-87-4] in 250 mL C6H6, refluxed 3 h and worked up to give 3,9-bis(N,N- diethylamino)-2,4,8,10-tetraoxa-3,9-diphosphaspiro(5.5)undecane-3,9- dioxide (I, R = diethylamino) [61090-87-7] m. 189.5-190.5°. An intumescent paint was prepared by mixing com. semi-gloss latex paint 75, chlorinated paraffin wax 5, I (R = diethylamino) 75 and water 10 g.

IT 61090-88-8
RL: USES (Uses)
(intumescent agents, for coatings)

RN 61090-88-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(3-chloro-2,2-dimethylpropoxy)-, 3,9-dioxide (9CI) (CA INDEX NAME)



IT 714-87-4
RL: RCT (Reactant); RACT (Reactant or reagent)
(reaction of, with dibromopropanol or diethylamine)

RN 714-87-4 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro-, 3,9-dioxide (CA INDEX NAME)

L26 ANSWER 24 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1977:17625 CAPLUS Full-text

DN 86:17625

TI Pentaerythritol cyclic diphosphates and diphosphoramidates

IN Albright, James A.

PA Michigan Chemical Corp., USA

SO U.S., 8 pp.
CODEN: USXXAM

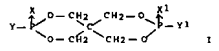
DT Patent

LA English

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3978167	A	19760831	US 1975-616935	19750926
	GB 1517651	A	19780712	GB 1976-1214	19760113
	GB 1517652	A	19780712	GB 1977-45795	19760113
	CA 1075257	A1	19800408	CA 1976-243559	19760113
	DE 2601278	A1	19770331	DE 1976-2601278	19760115
	DE 2601278	C3	19790503		
	US 4099975	A	19780711	US 1976-650282	19760119
	FR 2325655	A1	19770422	FR 1976-1611	19760121
	JP 52042891	A	19770404	JP 1976-9187	19760130
	JP 57056916	B	19821202		
PRAI	US 1974-429607	A2	19740102		
	US 1975-616935	A	19750926		
	US 1975-632569	A	19751117		
	GB 1976-1214	A	19760113		

GI



I

AB Organophosphorus compds. of the formula I, where X and X' = O or S and Y and Y' = monovalent halogenated oxyaliph. or oxyalicyclic or -NRR', where R and R' = H, monovalent hydrocarbon, or halogenated monovalent hydrocarbon, were useful as flame retardants for polymers. Thus, 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane-3,9-dioxide [714-87-4] 29.7, 2,3-dibromopropanol [96-13-9] 43.6, and MgO 0.1g were mixed together, heated 2 hr at 110° to drive off HCl, and cooled to room temperature to give a viscous product which was washed with NH4OH at 60° and then with H2O and dried under a vacuum. The light brown viscous product was 3,9-bis(2,3-dibromopropoxy)-2,4,8,10-tetraoxa-3,9- diphosphaspiro[5.5] undecane-3,9-dioxide [61090-85-5]..

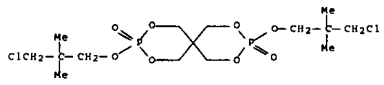
IT 61090-88-8P

RL: PREP (Preparation)

(preparation and flame retardant properties of)

RN 61090-88-8 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(3-chloro-2,2-dimethylpropoxy)-, 3,9-dioxide (9CI) (CA INDEX NAME)



IT 714-87-4

RL: RCT (Reactant); RACT (Reactant or reagent)

(reaction of, with alcohols or amines)

RN 714-87-4 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro-, 3,9-dioxide (CA INDEX NAME)

L126 ANSWER 22 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1976:561241 CAPLUS Full-text

DN 85:161241

TI Polycyclic phosphate esters

IN Batorewicz, Wadim

PA Uniroyal, Inc., USA

SO U.S., 7 pp.

CODEN: USXXAM

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3970726	A	19760720	US 1975-543289	19750123
	ZA 7507361	A	19761124	ZA 1975-7361	19751124
	AU 7587073	A	19770602	AU 1975-87073	19751128
	AU 499115	B2	19790405		
	DE 2559371	A1	19760729	DE 1975-2559371	19751231
	FR 2298553	A1	19760820	FR 1976-1585	19760121
	FR 2298553	B1	19790309		
	JP 51098224	A	19760830	JP 1976-5527	19760122
	PL 105884	B1	19791130	PL 1976-186703	19760122
	NL 7600743	A	19760727	NL 1976-743	19760123
	US 4054543	A	19771018	US 1976-663173	19760302
PRAI	US 1975-543289	A	19750123		

AB Fireproofing agents for polyurethane precursors to be foamed were made by reacting PCl3 with pentaerythritol [115-77-5] and either oxidizing-esterifying the product, or treating it with ethylene oxide [75-21-8] and chlorinating the product. Thus, the spiroadduct [3643-70-7] of pentaerythritol and PCl3 was oxidized and esterified with EtOH to give the Et ester. The latter was mixed with 1-(aminoethyl)piperazine-propylene oxide adduct, methylenebis(phenyl isocyanate), surfactants, curing agent, and blowing agents to give a polyurethane with O index 24.5, in contrast with the value of 20.6 when no fireproofing agents was used.

IT 60860-22-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and esterification of)

RN 60860-22-2 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-bis(2-chloroethoxy)- (CA INDEX NAME)

IT 3643-70-7P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation and reactions of)

RN 3643-70-7 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro- (CA INDEX NAME)

L126 ANSWER 23 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1963:475330 CAPLUS Full-text

DN 59:75330

OREF 59:13985h,13986a-d

TI Some chemical reactions of 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide

AU Raetz, Rudi F. W.; Sweeting, Orville J.

CS Olin Mathieson Chem. Corp., New Haven, CT

SO Journal of Organic Chemistry (1963), 28(6), 1608-12

CODEN: JOCEAH; ISSN: 0022-3263

DT Journal

LA Unavailable

GI For diagram(s), see printed CA Issue.

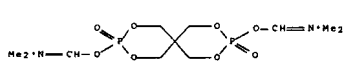
AB Pentaerythritol (I) is treated with POCl3 to give 3,9-dichloro-2,4,8,10tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (II) which is converted to an adduct with HCONMe2. II is treated with H2O and diols to give 3,9-dihydroxy-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5.5]undecane 3,9-dioxide (III). Thus, a mixture of 272.3 g. I and 660 g. POCl3 is heated 2 hrs. at 90° and 20 hrs. at 100°, the solid product mixed with 500 g. POCl3, the mixture refluxed 2 hrs., the excess POCl3 decanted, and the product heated at 120°/10 mm. The solid is washed 4 times with 200 ml. CCl4 and with 450 ml. cold absolute EtOH to give 478 g. II, m. 233-5° (HOAc). A solution of 1 g. II in 10 ml. anhydrous HCONMe2 is refluxed 20 min. and kept at room temperature, and excess HCONMe2 is distilled after 3 days to give 1.2 g. IV, λ 6.0 mμ. A solution is prepared from 19 g. crude II and 150 ml. anhydrous HCONMe2, 5.75 g. HO(CH2)4OH is added, and the mixture is refluxed 40 min. to give 19.0 g. monodimethylammonium salt, m. 266° (HO(CH2)4OH), 97.4% yield, of III. A mixture of 17.82 g. II and 5.4 g. HO(CH2)4OH is heated 1 hr. at 110° and 3 hrs. at 145°, and the mixture distilled at 145°/14 mm. to give an oil and a residue, and the residue is extracted with hot EtOH to give an insol. solid. The solid is treated with 50 ml. cold H2O and H2O is evaporated at room temperature to give 4.4 g. III and the EtOH extract is evaporated to dryness to give a total of 8.3 g. III, m. 306-7°(HOAc), 53.2% yield. The treatment of 5.94 g. II with 2.88 g. 1,4-bis(hydroxymethyl)cyclohexane at 195° also gives III. Crude III monodimethylammonium salt (2.2 g.) is dissolved in 25 ml. H2O and the solution is poured over a Dowex-50-W-X-8 column to give 99.8% III, m. 314° (HOAc). III (1.0 g.) is suspended in 4 g. HO(CH2)4OH, the mixture is heated at 160° as a tetrahydrofuran-H2O azeotrope distils, and 0.9 g. V, m. 314°, is obtained.

IT 96732-42-2

(Derived from data in the 7th Collective Formula Index (1962-1966))

RN 96732-42-2 CAPLUS

CN (Hydroxymethylene)dimethylammonium chloride, phosphate, cyclic diester with pentaerythritol (7CI) (CA INDEX NAME)



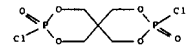
IT 714-87-4P, Pentaerythritol, cyclic diphosphorochloridate

RL: PREP (Preparation)

(preparation of)

RN 714-87-4 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro-, 3,9-dioxide (CA INDEX NAME)



L126 ANSWER 24 OF 24 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1963:82566 CAPLUS Full-text

DN 58:82566

OREF 58:14223g-h,14224a-b

TI Pentaerythritol phosphates for use as plasticizers

PA Agfa A.-G.

SO 5 pp.

DT Patent

LA Unavailable

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 922251		19630327	GB 1960-39545	19601117
	DE 1155901			DE	
	US 3090799		19630521	US 1960-69289	19601115
PRAI	DE		19591117		

GI For diagram(s), see printed CA Issue.

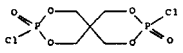
AB Migration and volatility are avoided by using esters of the general formula I, where R and Y are the same or different aryl or alkyl radicals or substituted radicals. Such esters are solvents for most thermoplastic materials. They are made by heating pentaerythritol (II) with POCl3 and phenols or alcs., or by heating phosphates in vacuo with OH compds. Thus 136 g. II and 500 ml. POCl3 were heated together on a steam bath. The residual POCl3 was distilled off in vacuo to give about 250 g. acid ester chloride (III), m. 243-5°. III (300 g.) and PhOH 220 were refluxed with 3 l. CH2Cl2 and 300 ml. Et3N. The CH2Cl2 was distilled and the residue extracted with a mixture of CH2Cl2 and H2O. The Et3N salt entered the H2O phase and the II phosphate ester dissolved in the CH2Cl2. Evaporation of the solvent left 300 g. I (R = Y = Ph) (IV), m. 201-2°. Similarly prepared were I (R = Y = 4-MeC6H4), m. 213°, (from p-cresol); the waxlike I [R = Y = Me(CH2)11] (from lauryl alc.); the thick viscous oil I (R = Y = EtOCH2CH2) (from monoethyl glycol); the viscous oil I [R = Y = NC(CH2)2O(CH2)2] from β-cyanoethyl glycol; I (R = Y = 4-EtO2CC6H4), m. 212°, (from 4-HOC6H4CO2Et); and I (R = Y = 4-ClC6H4) m. 221-2°, (from p-chlorophenol). Cellulose triacetate (50 g.) was dissolved in iso-PrOH 6, CH2Cl2 300, and IV 10 dissolved in CH2Cl2 50 parts was added. The solution was freed of bubbles by heating, then cooled and cast on a plate from which it was stripped when dry. The clear film was suitable for a photographic emulsion support. Similar films were made from IV and polystyrene and from IV and poly(vinyl chloride). The other esters described were also used to produce suitable films of good mech. properties.

IT 714-87-4 57575-99-9

(Derived from data in the 7th Collective Formula Index (1962-1966))

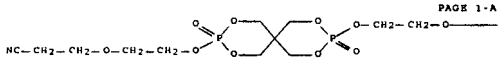
RN 714-87-4 CAPLUS

CN 2,4,8,10-Tetraoxa-3,9-diphosphaspiro[5.5]undecane, 3,9-dichloro-, 3,9-dioxide (CA INDEX NAME)



RN 97575-98-9 CAPLUS
CN Phosphoric acid, ester with 3-(2-hydroxyethoxy)propionitrile, cyclic diester with pentaerythritol (7CI) (CA INDEX NAME)

PAGE 1-A



PAGE 1-B

IT 4991-39-3P, Ethanol, 2-ethoxy-, phosphate, cyclic diester with pentaerythritol
RL: PREP (Preparation)
(preparation of)
RN 4991-39-3 CAPLUS
CN Phosphoric acid, cyclic diester with pentaerythritol, bis(2-ethoxyethyl) ester (8CI) (CA INDEX NAME)

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FULL ESTIMATED COST	126.95	600.39

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	-18.72	-18.72

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